13. Objects

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13.1. Bit Lamp

13.1.1. Overview

Bit Lamp object displays the state of a designated bit address. If the bit state is OFF, the State 0 shape will be displayed. If the bit state is ON, the State 1 shape will be displayed.

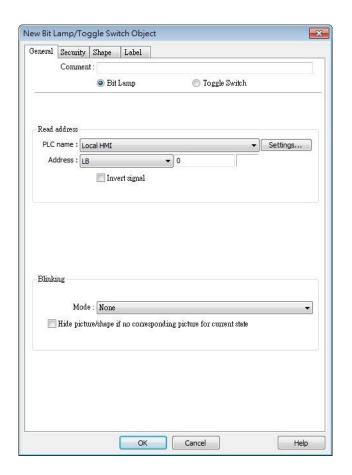


13.1.2. Configuration



Click the Bit Lamp icon on the toolbar to open a Bit Lamp object property dialog box. Set up the properties, press OK button, and a new Bit Lamp object will be created.

General Tab





Setting	Description		
Comment	User can describe the information of the object. Bit Lamp / Toggle Switch		
	Switch between Bit Lamp and Toggle Switch features.		
Read address	Click [Setting] to select the [PLC name], [Address], [Device type],		
	[System tag], [Index register] of the bit device that controls the [Bit		
	Lamp] object. Users can also set address in [General] tab while		
	adding a new object.		
	Invert signal		
	Reverses the display of ON / OFF states. For example, if [Invert		
	signal] check box is selected, when the designated bit is OFF, the		
	object displays ON state.		
Blinking	The appearance of the object may alternate between states when		
	the bit is ON or OFF.		
	Mode:		
	None		
	No blinking.		
	Alternating image on state 0		
	The appearance of the object alternates between State 0 and 1		
	when the bit is OFF.		
	Alternating image on state 1		
	The appearance of the object alternates between State 0 and 1		
	when the bit is ON.		
	Blinking on state 0		
	The State 0 appearance of the object will blink when the bit is OFF.		
	Blinking on state 1		
	The State 1 appearance of the object will blink when the bit is ON.		
	Hide picture/shape if no corresponding picture for current state		
	If selected, when there are not enough pictures to represent all the		
	states, hides the picture. Otherwise, displays the last state.		



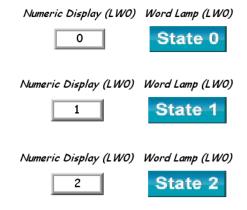
■ In [Label] tab, if select [ON=OFF (use state 0)] check box, both state 0 and 1 follow the settings of state 0.



13.2. Word Lamp

13.2.1. Overview

Word Lamp object displays the state according to the value of a designated word register. Up to 256 states are available. When the value of the register is 0, State 0 appearance of the object is displayed, and with the register value being 1 the object displays State 1, and so on.

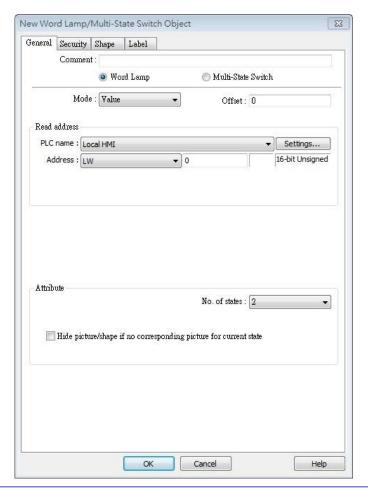


13.2.2. Configuration



Click the Word Lamp icon on the toolbar to open a Word Lamp object property dialog box. Set up the properties, press OK button, and a new Word Lamp object will be created.

General Tab



Comment User can describe the information of the object. Word Lamp / Multi-State Switch Switch between Word Lamp and Multi-State Switch features.

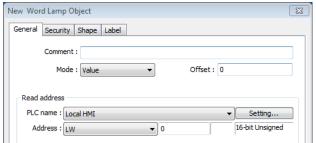
Mode / Offset

Word Lamp object offers the following three modes:

Value

The state is displayed according to the value in the designated word address and plus the [Offset].

As shown below, if the value within LW-200 is 3, since the offset is set to 3, the shape of state 6 is displayed. (value 3 + offset 3)





LSBConvert the value from decimal to binary. The least significant active bit in a binary data word selects the state displayed.

Decimal	Binary	Displayed state
0	0000	State 0 displayed. All the bits are 0.
1	0001	State 1 displayed. The least significant active bit is bit 0.
2	0010	State 2 displayed. The least significant active bit is bit 1.
3	0011	State 1 displayed. The least significant active bit is bit 0.
4	0100	State 3 displayed. The least significant active bit is bit 2.
5	0101	State 1 displayed. The least significant active bit is bit 0.
6	0110	State 2 displayed. The least significant active bit is bit 1.
7	0111	State 1 displayed. The least significant active bit is bit 0.
8	1000	State 4 displayed. The least significant active bit is bit 3.

Bit combination

Lamp state depends on the states of bit combinations, where PLC 1 represents the least significant bit (LSB), PLC 2 represents the next LSB, and so on. Maximum number of bit is 4, for a total of 16 states. Changing [No. of states] in Attribute group box changes the number of read addresses.



Change state by time

The state displayed changes on a time basis. The frequency can be set.

Read address

Click [Setting] to select the [PLC name], [Address], [Device type], [System tag], [Index register] of the word device that controls the



[Word Lamp] object. Users can also set address in [General] tab while adding a new object.

Attribute

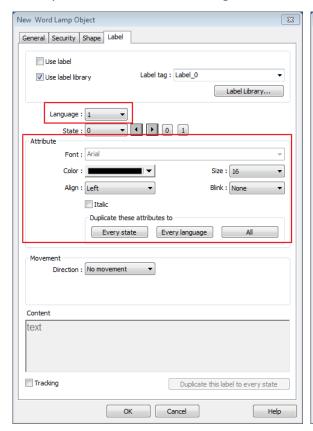
No. of states

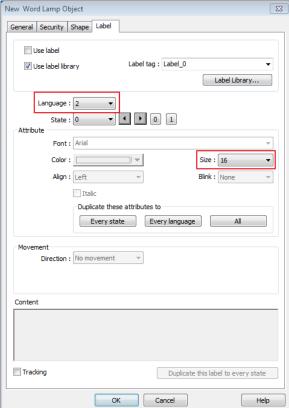
The number of states is utilized by the object. The state is numbered from 0, so the number of states minus 1 will be the state number. If the value within the word register is \geq [No. of states] defined in Attribute, the highest state will be displayed. If the number of states is set to 8, the valid states will be 0, 1, 2, ..., 7. In this case if the word value is 8 or higher, the system will display the state 7 shape.

Hide picture/shape if no corresponding picture for current state If selected, when there are not enough pictures to represent all the states, hides the picture. Otherwise, displays the last state.



■ In [Label] tab, Language 1 determines the relevant settings of the font. For Language 2~8, only the font size can be changed and other settings follow Language 1.







13.3. Set Bit

13.3.1. Overview

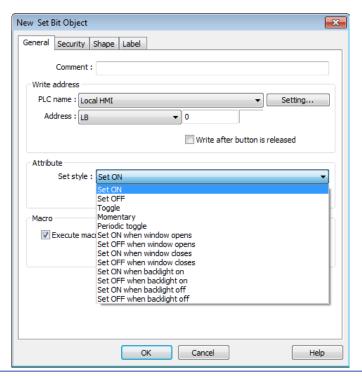
The Set Bit object provides two operation modes: manual or automatic. Manual mode can trigger a designated bit address to change the state between ON and OFF when the object is touched. In automatic mode, the bit is automatically activated when a pre-defined condition occurs; touching the button will not be effective.

13.3.2. Configuration



Click the Set Bit icon on the toolbar to open a Set Bit object property dialog box. Set up the properties, press OK button, and a new Set Bit object will be created.

General Tab



Setting Description

Write address

Click [Setting] to select the [PLC name], [Address], [Device type], [System tag], [Index register] of the bit device that controls the Set Bit object. Users can also set address in [General] tab while adding a new object.



Description

Set style

(N/A for cMT)

Set OFF when backlight on

(N/A for cMT)
Set ON when

backlight off

(N/A for cMT)
Set OFF when

backlight off

(N/A for cMT)

Write after button is released If this function is selected, the action is delayed till button is released; otherwise, the action is executed once the button is

pressed. This function does not work with momentary buttons.

Set ON	Set ON the designated bit of the device.
Set OFF	Set OFF the designated bit of the device.
Toggle	Alternates the bit state each time pressed.
Momentary	Holds the bit ON only while button is pressed.
Periodical toggle	Set a designated bit ON and OFF at a set time
	interval. Time interval can be selected; the
	range is from 0.1 to 25.5 seconds.
Set ON when	Set ON the bit within the window when the
window opens	window opens.
Set OFF when	Set OFF the bit within the window when the
window opens	window opens.
Set ON when	Set ON the bit within the window when the
window closes	window closes.
Set OFF when	Set OFF the bit within the window when the
window closes	window closes.
Set ON when	Set the bit ON when the backlight is turned
backlight on	ON.

ON.

OFF.

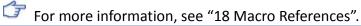
OFF.

Set Bit object can trigger the start of a Macro routine when the Macro has been created in advance.

Set the bit OFF when the backlight is turned

Set the bit ON when the backlight is turned

Set the bit OFF when the backlight is turned



Trigger mode

Mode / Offset

If [Set style] is set to [Toggle], there is a further selection to make of whether the macro operates after Off to ON, ON to OFF transition, or at both of the changes of state.



In [Label] tab, if select [ON=OFF (use state 0)] check box, both state 0 and 1 follow the settings of state 0.



13.4. Set Word

13.4.1. Overview

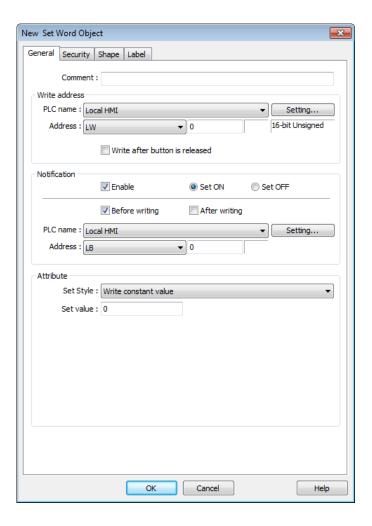
The Set Word object provides two operation modes: manual or automatic. Manual mode can change the value in a designated word address when the object is touched. In automatic mode, the word register is automatically activated when a pre-defined condition occurs; touching the button will not be effective.

13.4.2. Configuration



Click the Set Word icon on the toolbar to open a Set Word object property dialog box. Set up the properties, press OK button, and a new Set Word object will be created.

General Tab





Setting	Description	
Write address	Click [Setting] to select the [PLC name], [Address], [Device type],	
	[System tag], [Index register] of the word device that controls the	
	Set Word object. Users can also set address in [General] tab while	
	adding a new object.	
	Write after button is released	
	If this function is selected, the action is delayed till button is	
	released; otherwise, the action is executed once the button is	
	pressed.	
Notification	If this check box is selected, it will notify a designated bit address	
	(setting ON or OFF).	
	Before writing / After writing	
	Set the state of the designated bit address before or after the	
	manual operation.	
Attribute	Set Style	
	Select the button action from the drop down list, see Example 2.	
	Dynamic limits	
	Set the [Bottom limit] and [Upper limit] by a designated register,	
	see Example 1.	
1 4		

Example 1

Set the [Bottom limit] and [Upper limit] by a designated register. When Dynamic Address is LW-n, where n is an arbitrary number, the rule of setting Upper / Bottom limit is:

	Content	16-bit	32-bit	
	Dynamic address	LW-n	LW-n	
	Bottom limit	LW-n	LW-n	
	Upper limit	LW-n+1	LW-n+2	
When Dynamic Ac	When Dynamic Address is LW-100, the rule of setting Upper / Bottom limit is:			
	Content	16-bit	32-bit	
	Dynamic address	LW-100	LW-100	
	Bottom limit	LW-100	LW-100	

Example 2

The available button actions are:

Upper limit

Write constant value

Preset a register with the value entered. Each time when the button is pressed, it writes the [Set value] to the designated register. Data format is as set by the [Write address]; it can be 16-bit BCD, 32-bit BCD, ...32-bit float. As shown below, when the button is pressed, preset the register with 12.

LW-101

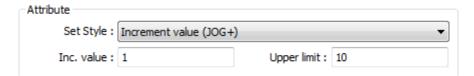
LW-102





Increment value (JOG+)

Increase value in register by a set amount in [Inc. value], each time when the button is pressed, up to the [Upper limit]. As shown below, each button press increases the value in the register by 1 until the value is 10.



Decrement Value (JOG-)

Decrease value in register by a set amount in [Dec. value], each time when the button is pressed, down to the [Bottom limit]. As shown below, each button press decreases the value in the register by 1 until the value is 0.



Press and hold increment (JOG++)

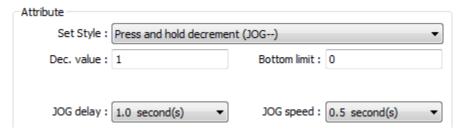
When the button is held longer than a set time in [JOG delay], it will increase the value in a register by a set amount :[Inc. value] at a set rate :[JOG speed], to the [Upper limit]. As shown below, when the button is pressed, it increases the value in the designated register by 1. When the button is held longer than 1 second, it increases the value in register by 1 every 0.5 second, till the value is 10.



Press and hold increment (JOG--)

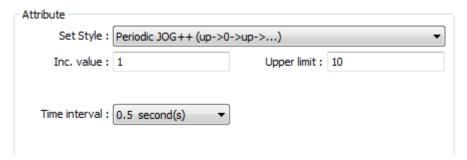
When the button is held longer than a set time in [JOG delay], it will decrease the value in a register by a set amount: [Dec. value] at a set rate: [JOG speed], to the [Bottom limit]. As shown below, when the button is pressed, it decreases the value in the designated register by 1. When the button is held longer than 1 second, it decreases the value in register by 1 every 0.5 second, till the value is 0.





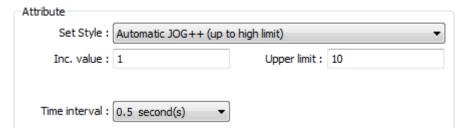
Periodic JOG++

This automatic function increases the value in the register by a set amount: [Inc. value], at a set rate: [Time interval], to the [Upper limit]. As shown below, the system will automatically increase the value in the register by 1 every 0.5 second, till the value is 10. Then the value returns to 0 and add 1 every 0.5 second again.



Automatic JOG++

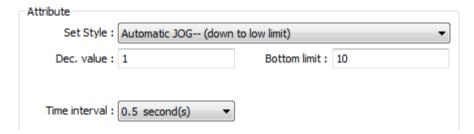
This automatic function increases the value in the register by a set amount: [Inc. value], at a set rate: [Time interval], to the [Upper limit].then holds this value. As shown below, the system will automatically increase the value in the register by 1 every 0.5 second, till the value is 10, and then stop.



Automatic JOG--

This automatic function decreases the value in the register by a set amount: [Dec. value], at a set rate: [Time interval], to the [Bottom limit].then holds this value. As shown below, the system will automatically increase the value in the register by 1 every 0.5 second, till the value is 10, and then stop.





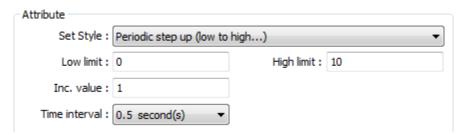
Periodic bounce

Increases the word address value to the [Upper limit] by a [Inc. value] at a set rate in [Time interval], then decreases to the [Bottom limit] by the same value at the same rate. As shown below, the system will increase the value in the designated register by 1 every 0.5 second, till the value is 10, and then decrease the value by 1 every 0.5 second till the value is 0 whenever the screen is active.



Periodic step up

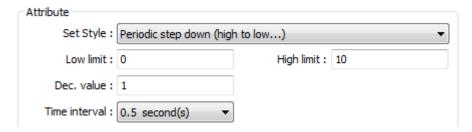
Step up to the [High limit] by [Inc. value] at a set rate in [Time interval], then reset immediately to the [Low limit]. The action repeats whenever the screen is active. As shown below, the system will increase the value in the designated register by 1 every 0.5 second, till the value is 10, and then reset to 0 and increase again, and the action repeats.



Periodic step down

Step down to the [Low limit] by [Dec. value] at a set rate in [Time interval], then reset immediately to the [High limit]. The action repeats whenever the screen is active. As shown below, the system will decrease the value in the designated register by 1 every 0.5 second, till the value is 0, and then reset to 10 and decrease again, and the action repeats.





Set when window opens / Set when window closes

Automatic function occurs whenever the screen is active. The value entered in [Set value] is set into the word address when the action occurs. If [Set value] is set to 5, when the window opens / closes, the system enters 5 into the designated register.

Set when backlight on / Set when backlight off

Automatic function occurs whenever the backlight is active. The value entered in [Set value] is set into the word address when the action occurs. If [Set value] is set to 5, when the backlight turns ON / OFF, the system sets 5 into the designated register.

Cyclic JOG+

Each time when the button is pressed, increases the word address value to the [Upper limit] by [Inc. value] then reset to the [Bottom limit]. As shown below, each time when pressing the button, the system will increase the value in the designated register by 1, till the value is 10, and then reset to 0 and increase again by pressing the button.



Cyclic JOG-

Each time when the button is pressed, decrease the word address value to the [Bottom limit] by [Dec. value] then reset to the [Upper limit]. As shown below, each time when pressing the button, the system will decrease the value in the designated register by 1, till the value is 0, and then reset to 10 and decrease again by pressing the button.

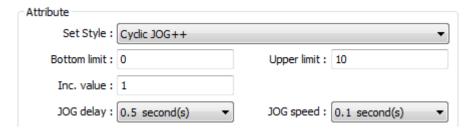
Attribute			
Set Style:	Cyclic JOG-		•
Bottom limit:	0	Upper limit :	10
Dec. value :	1		

Cyclic JOG++

When the button is held longer than a set time in [JOG delay], it increases the value in a register by a set amount in [Inc. value] at a set rate in [JOG speed], to the [Upper limit], then reset to the [Bottom limit]. As shown below, when the button is held longer than 0.5 second, increase the value in the designated register by 1 every 0.1 second, till the value is 10, and then



reset to 0 and increase again by holding the button.



Cyclic JOG- -

When the button is held longer than a set time in [JOG delay], decrease the value in a register by a set amount in [Dec. value] at a set rate in [JOG speed], to the [Bottom limit], then reset to the [Upper limit]. As shown below, when the button is held longer than 0.5 second, decrease the value in the designated register by 1 every 0.1 second, till the value is 0, and then reset to 10 and decrease again by holding the button.





13.5. Function Key

13.5.1. Overview

The Function Key object can be used for several tasks, such as switching between windows, keypad design, Macro execution, screen hardcopy, and setting USB security key.

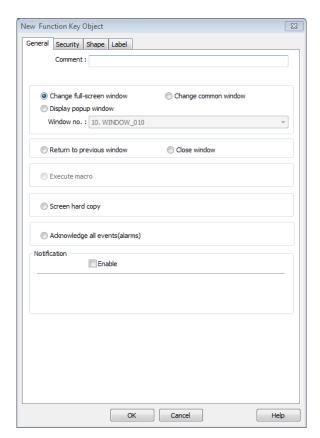
13.5.2. Configuration



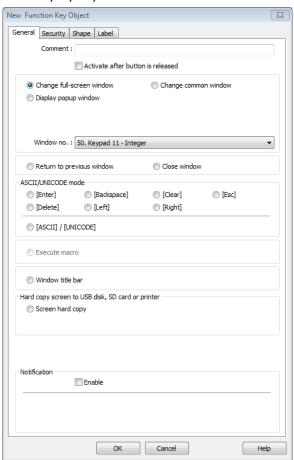
Click the Function Key icon on the toolbar to open a Function Key object property dialog box. Set up the properties, press OK button, and a new Function Key object will be created.

General Tab

cMT Series



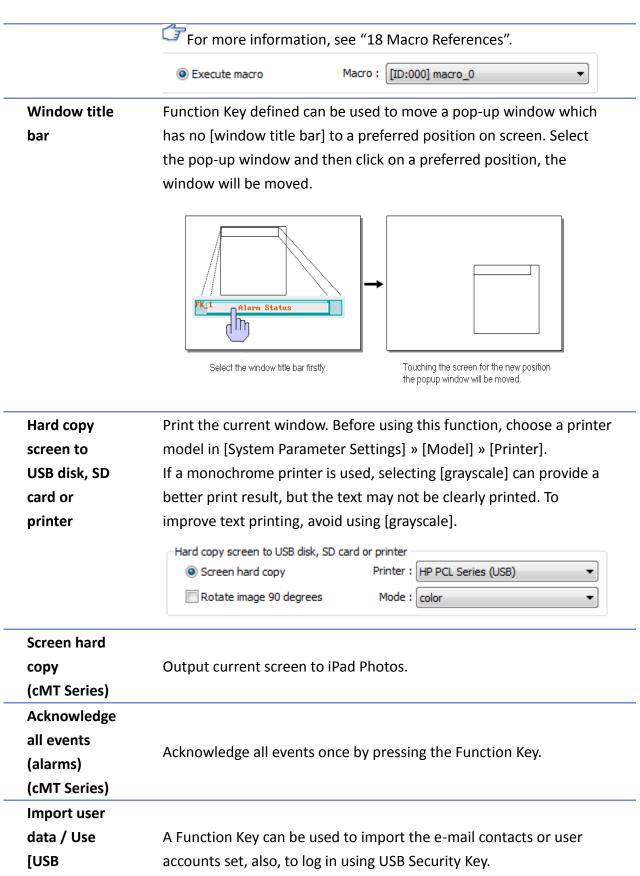
eMT, iE, XE, mTV Series





Setting	Description		
Activate	If this function is selected, the action is delayed till button is		
after button released; otherwise, the action is executed once the button is is released pressed.			
			Change Change full-screen window: Change to another base win
window	Change common window: Change common window.		
	Display popup window: A pop-up window displays in the base		
	window. If [Close this popup window when parent window is closed]		
	check box is selected, the pop up window will be closed when		
	change the base window to another window. Otherwise, a function		
	key in the pop up window is needed to close it.		
	Display popup window		
	✓ Close this popup window when parent window is closed		
	Style : With title bar ▼		
	Window no. : 11. Window_011		
	Return to previous window: If this is selected, the Function Key will		
	change from the current screen to the previous one displayed. For		
	example, when window no. 10 is changed to window no. 20, press		
	the function key to return to window no. 10. This function is only		
	available for base window.		
	Close window: Close any active pop-up windows, message windows		
	included.		
ASCII/	Configures the button as a keypad key, and the character it enters,		
UNICODE	via [Numeric] or [ASCII] objects.		
mode	Enter: Same as the keyboard's "Enter" function.		
	Backspace: Same as the keyboard's "Backspace" function.		
	Clear: Clear the value in the word register.		
	Esc: Same as the [Close window] function; it is used to close the		
	keyboard window.		
	Delete: Same as the keyboard's "Delete" function, deletes the		
	number or character on the right side of the text cursor.		
	Left: Same as the keyboard's "←" key moves the text cursor to the		
	left side of the previous number or character.		
	Right: Same as the keyboard's "→" key moves the text cursor to the		
	left side of the next number or character.		
	ASCII/UNICODE: Specify the character to be entered by this key.		
Execute	Select this check box to execute one of the Macros from the drop		
Macro down list that has already been configured by users.			





Security Key]



Data Position

Select the external device to store data from [SD card] or [USB disk].

Account import mode

If [Overwrite] is selected, the existing accounts will be overwritten with new accounts in the external device after importing. If [Append] is selected, HMI will append more accounts while the old accounts still exist.

Delete file after importing user accounts

If select this check box, the system will delete the account data saved in the external device after importing, this can prevent the account data from leaking out.

Notification

If this selection is enabled, it will notify a designated bit address to set ON or OFF, each time the button is pressed.



- [Overwrite] is the only option when importing the e-mail contacts. This means that all existing contacts will be removed first, and then the new contacts are added.
- For more information, see "6 Window Operations", "12 Keypad Design and Usage", "36 Administrator Tools".



13.6. Toggle Switch

13.6.1. Overview

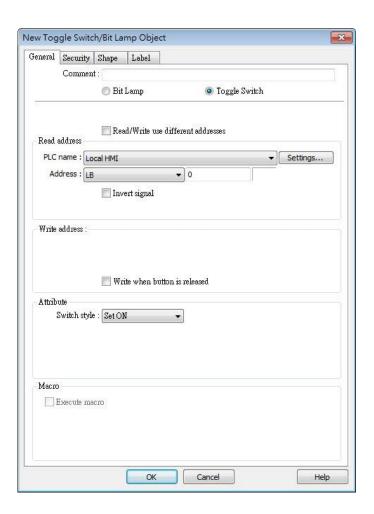
Toggle Switch object is a combination of Bit Lamp object and Set Bit object. The appearance of the object is controlled by the ON / OFF state of the read bit address. As well, pressing the button sets the value in the bit address according to the settings.

13.6.2. Configuration



Click the Toggle Switch icon on the toolbar to open a Toggle Switch object property dialog. Set up the properties, press OK button, and a new Toggle Switch object will be created.

General Tab





Setting	Description		
Comment	User can describe the information of the object. Bit Lamp / Toggle Switch		
	Switch between	Bit Lamp and Toggle Switch features.	
Read address	Click [Setting] to	select the [PLC name], [Address], [Device type],	
	[System tag], [Index register] of the bit device that controls the		
	[Toggle Switch] c	object. Users can also set address in [General] tab	
	while adding a n	ew object.	
	Invert signal		
	Reverses the display of ON / OFF states. For example, if [Invert		
	signal] check box is selected, when the designated bit is OFF, the		
	object displays C	N state.	
Write address	Click [Setting] to select the [PLC name], [Address], [Device type],		
	[System tag], [Index register] of the bit device that controls the		
	[Toggle Switch] object. Users can also set address in [General] tab		
	while adding a new object. The address can be the same or		
	different from [Read address].		
	Write after button is released		
	If this function is selected, the action is delayed till button is		
	released, otherwise, the action is executed once the button is		
	pressed. This fur	nction does not work with momentary buttons.	
Attribute	Set style	Description	
	Set ON	Set ON the designated bit of the device.	
	Set OFF	Set OFF the designated bit of the device.	
	Toggle	Alternates the bit state each time pressed.	
	Momentary	Holds the bit ON only while button is	
		pressed.	
Macro	Toggle Switch ob	ject can trigger the start of a Macro routine when	
	the Macro has b	een created in advance.	
	4	formation, see "18 Macro References".	



13.7. Multi-State Switch

13.7.1. Overview

Multi-state Switch object is a combination of Word Lamp object and Set Word object. The appearance of the object is controlled by the value of the read word address. As well, pressing the button sets the value in the word address according to the settings.

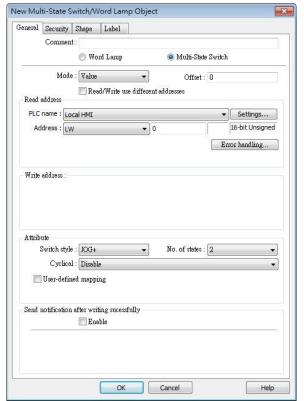
13.7.2. Configuration



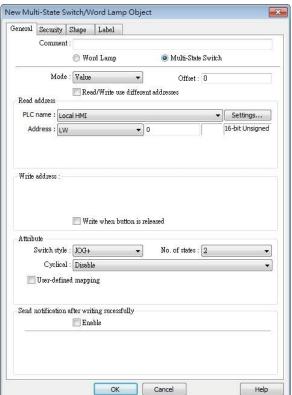
Click the Multi-State Switch icon on the toolbar to open a Multi-State Switch object property dialog box. Set up the properties, press OK button, and a new Multi-State Switch object will be created.

General Tab

cMT Series



eMT, iE, XE, mTV Series

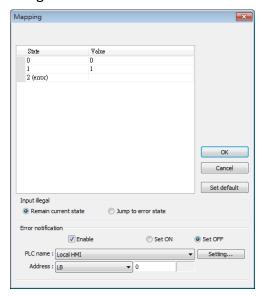




Setting	Description	
Comment	User can describe the information of the object.	
	Word Lamp / Multi-State Switch	
	Switch between Word Lamp and Multi-State Switch features.	
Model /	Different modes can be selected: [Value], [LSB].	
Offset	For more information, see "13.2 Word Lamp".	
Read address	Click [Setting] to select the [PLC name], [Address], [Device type],	
	[System tag], [Index register] of the word device that controls the	
	Multi-state Switch object. Users can also set address in [General]	
	tab while adding a new object.	
Write address	Click [Setting] to select the [PLC name], [Address], [Device type],	
	[System tag], [Index register] of the word device that controls the	
	Multi-state Switch object. Users can also set address in [General]	
	tab while adding a new object.	
	Write after button is released	
	If this function is selected, the action is delayed till button is	
	released; otherwise, the action is executed once the button is	
	pressed.	
Attribute	Switch style	
	Select the object's operation mode, see Example 1.	

User-defined mapping

The value placed in the write register of each selection, the action taken when an illegal value is entered, and error notification to a designated bit address can be set.



Remain current state

If an illegal value is entered, Multi-state Switch will remain at the



	current state.	
	Jump to error state	
	If an illegal value is entered, Multi-state Switch will jump to the	
	error state.	
	Error notification	
	If an illegal value is entered, automatically set the value placed in	
	the designated register.	
Send		
notification	After the system successfully writes data to PLC, the designated bit	
after writing	address will be set On/Off.	
successfully		
Error handling	The action taken when an illegal value is entered or notify a	
(cMT-SVR	designated bit address. This is similar to [User-defined mapping];	
Series)	the difference is the value corresponding to each state need not to	
	be preset.	

Example 1

JOG+

Increase the value of a designated register by 1 each time when pressing the button, till the value equals to [No. of states]. A cyclic action can be enabled. As shown below, each time when pressing the button, the state number will add 1 start from state 0, till state 4 ([no. of state]-1), and returns to 0 and step up again.



JOG-

Decrease the value of the designated register by 1 each time when pressing the button, till the value equals to 0. A cyclic action can be enabled. As shown below, each time when pressing the button, the state number will minus 1 start from state 4 ([no. of state]-1), till state 0, and returns to state 4 and step down again.





13.8. Slider

13.8.1. Overview

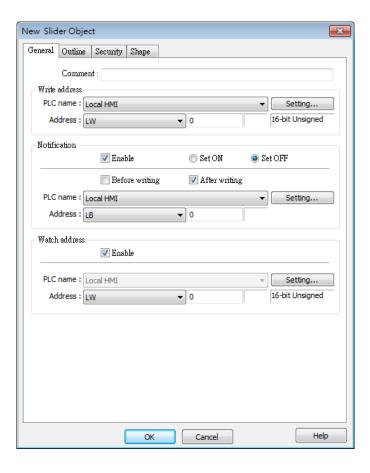
Slider object is used to change the value in a designated word register address by moving the slide on the screen.

13.8.2. Configuration



Click the Slider icon on the toolbar to open a Slider object property dialog box. Set up the properties, press OK button, and a new Slider object will be created.

General Tab

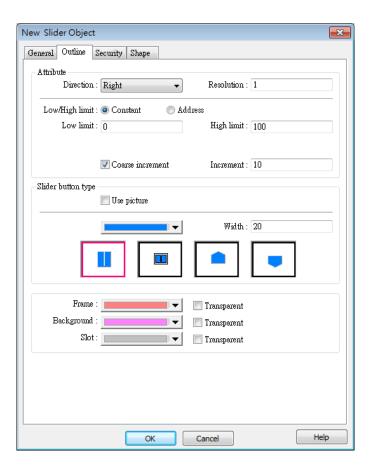


Setting	Description	
Write address	Click [Setting] to select the [PLC name], [Address], [Device type],	
	[System tag], [Index register] of the word device that controls the	



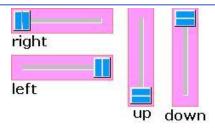
	Slider object. Users can also set address in [General] tab while
	adding a new object.
Notification	If enabled, the state of a designated bit address will be set to ON or
	OFF.
	Click [Setting] to select the [PLC name], [Address], [Device type],
	[System tag], [Index register] of the bit device that controls the
	notification settings. Users can also set address in [General] tab
	while adding a new object.
	[Before writing] / [After writing]
	Change the state of a designated bit register before, or after the
	slider is slid.
Watch	When moving the roller, the new value written to the word register
address	address can be displayed in real time.

Outline Tab



Setting	Description
Attribute	Direction
	Select the direction of the slider. (Right, Up, Left, Down)





Resolution

Sets the value change in the word register for each step of the Slider. For example, if set to 10, the register value changes by 10 points for each increment or decrement on the Slider.

Constant

Sets the range of the Slider. For example, If set [Low limit] to 5, and [High limit] to 100, the Slider will enter values between 5 and 100.

Address

Set the [Low/High limit] by a designated register, see Example 1.

Coarse increment

Apart from moving the roller to change the value as in [Resolution], if this option is selected, the word value will increase / decrease by the [Increment] value each time the object is touched.

Slider button type

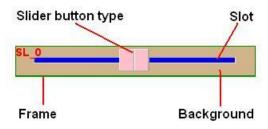
Use picture (cMT Series only)

If this checkbox is selected, a picture can be selected from the Picture Library to be the slider button.

Four default styles are offered here, and the width of the Slider may be set.

Color

Colors of the frame, background, and slot may be chosen.





Example 1

When address is

Set the low or high limit by a designated register. When write address is LW-n, where n is an arbitrary number, the rule of setting limits is:

16-bit	32-bit
LW-n	LW-n
LW-n	LW-n
LW-n+1	LW-n+2
g limits is:	
16-bit	32-bit
LW-100	LW-100
LW-100	LW-100
LW-101	LW-102
	LW-n LW-n+1 g limits is: 16-bit LW-100 LW-100



13.9. Numeric

13.9.1. Overview

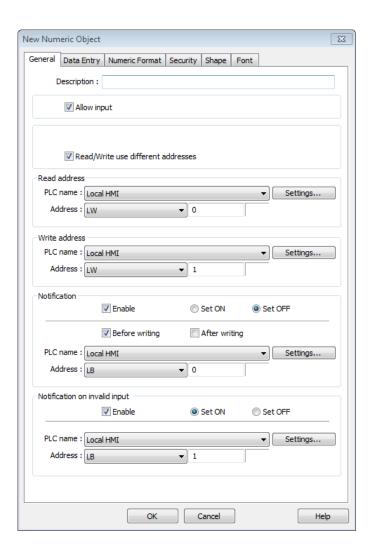
Numeric object can be used to input or display the value of a designated word register.

13.9.2. Configuration



Click the Numeric icon on the toolbar to open a Numeric object property dialog box. Set up the properties, press OK button, and a new Numeric object will be created.

General Tab

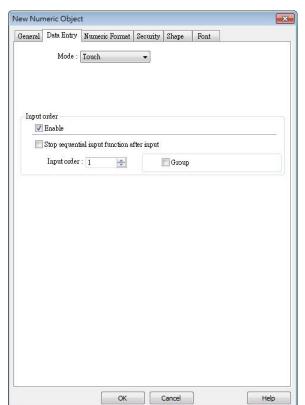




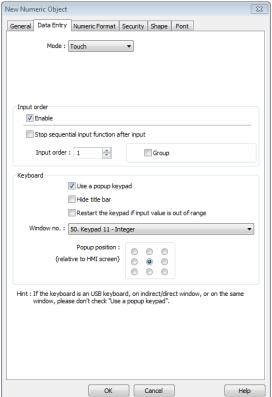
Description	
If selected, the input features and relevant settings are enabled.	
Set [Read address] and [Write address] differently.	
Click [Setting] to select the [PLC name], [Address], [Device type],	
[System tag], [Index register] of the word device that displays the	
value. Users can also select a tag defined in Address Tag Library	
Select the [PLC name], [Device type], [Address] of the word device	
that system writes to.	
If this check box is selected, it will notify a designated bit address	
(setting ON or OFF).	
Before writing / After writing	
Set the state of the designated bit address before or after the	
manual operation.	
If an illegal value is entered, automatically set the state of a	
designated register.	

Data Entry Tab

cMT Series



eMT, iE, XE, mTV Series





Setting	Description	
Mode	Touch	
	Used when data entry is initiated by touching the screen object.	
	Bit control	
	Used when data entry is enabled by turning ON a designated bit,	
	and entry ends when the bit goes OFF.	
Allow input	Specify a bit address that enables or ends data entry. The order of	
bit address	data entry is specified in [Input order] and an external USB	
	keyboard is needed for data entry. For cMT-SVR, use iPad's keyboard.	
Input order	Perform continuous input by setting [Input order] and [Group].	
	The criterion of searching the next input object:	
	The range of [Input order]: 1 ~ 511, range of [Group]: 1 ~ 15.	
	If [Group] is not selected, its input order is 0.	
	The system only searches for the objects within the same	
	Group.	
	 The lower number of order is entered before the higher 	
	number of order.	
	 For multiple objects within the same group and with the same 	
	input order, the object placed in the lower layer is entered first.	
Keyboard	Use a popup keypad	
(For eMT, iE,	If selected: A pre-designed pop-up keypad can be chosen by	
XE, mTV	selecting a check box, and selecting the relative position on the	
Series)	HMI screen. When data entry is enabled, the pop-up keypad	
	displays in the selected position, and closed when data entry ends.	
	If not selected: When data entry is enabled, the pop-up keypad is	
	not displayed. Users may:	
	 Create a custom design on the same screen window. 	
	Use a USB keyboard.	
	Hide title bar	
	Use a keypad without the title bar.	
	Restart the keypad if input value is out of range	
	When entering data, if the value entered is not within the valid	
	range, the system will automatically restart the keypad.	



■ To enter data for cMT-SVR, the iPad's keyboard is used.





To create a keyboard in current window, see "12 Keypad Design and Usage".

Example 1

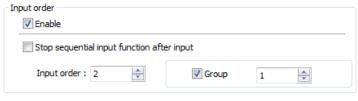
This example demonstrates how to use [Input Order] and [Group] to perform continuous input in several Numeric objects. After entering data in one object, entry will be passed to the next input order object which is in the same group.

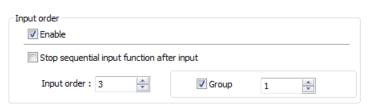
Create three Numeric objects, and set [Input order] to 1, 2, and 3 respectively. Include the three objects in [Group 1] as shown in the following figure. LW-0

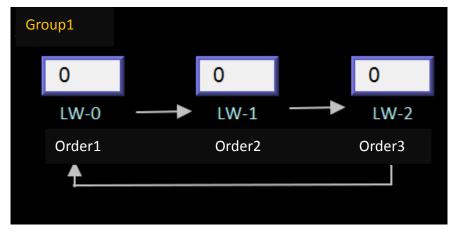


LW-2

LW-1

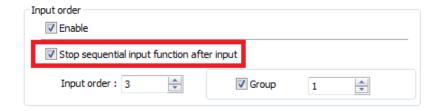






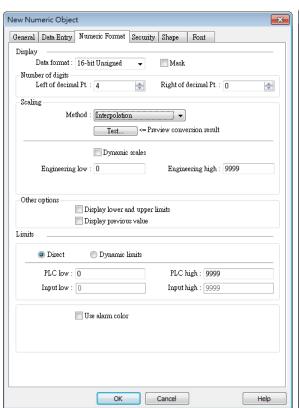
2. When finish entering data in the last object, to end data entry of all objects, please select [Stop sequential input function after input] check box.



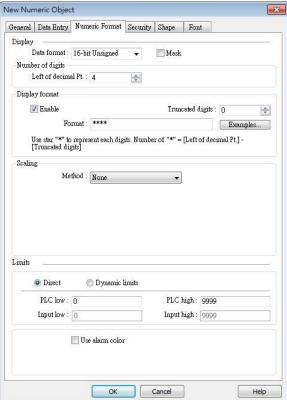


Numeric Format Tab

cMT Series



eMT, iE, XE, mTV Series



Setting	Description	
Display	Data Format	
	Set the data format of a designated word register. The selections	
	include: BCD, HEX, Binary, Unsigned, Signed, Float. 16-bit uses 1	
	word where 32-bit uses two words.	
	Mask	
	If selected, any values entered will be hidden by displaying them as	

Number of	Left of decimal Pt.	
digits	The number of digits before the decimal point.	
	Right of decimal Pt.	
	The number of digits after the decimal point.	



Display format

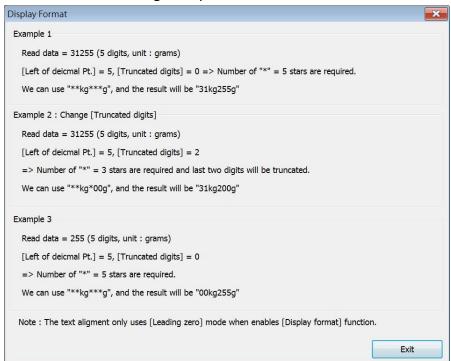
If [Enable] check box is selected, the [Allow input] feature in General tab will be disabled. Each "*" sign represents each digit that will be displayed in the Numeric object. Apart from "*" signs, extra texts can be entered in the [Format] field, for example: kg.

The numeric value represented by "*" sign will be displayed from the highest digit to the lowest in the Numeric object.

Truncated digits

Specify the number of digis to be truncated, from the lowest digit to the highest.

The number of "*" signs = [Left of decimal Pt.]-[Truncated digits] Please see the following examples:



Scaling Interpolation

If this check box is selected, [Engineering low] and [Engineering high] boxes appear. Values entered in these boxes correspond to the display range required. The setting also requires [Input low] and [Input high] in the limits section. See Example 2.

Test: Preview the result of Interpolation. See Example 2.

Dynamic scales: Set the [Engineering low] and [Engineering high] by a designated register. See Example 4.

Macro subroutine (Not available for cMT Series)

The value read from or written to the register can be computed by macro subroutines selected in [Read conversion] and [Write conversion]. The macro subroutines should be diefined in Macro



	Function Library. To use this feature, see "13.9.2.1 The rule of using	
	Macro subroutine".	
Other options	Display lower and upper limits	
(For cMT	If selected, when entering a value, the range 1234	
Series)	is displayed near the object.	
	Display previous value Range: 0 to 9999	
	If selected, when entering a value, the value Current value: 5	
	before update is displayed near the object.	
Limits	This section allows users to apply display limits to the values held in	
	the input register. The color when the register value is outside limits	
	can be set.	
	Direct	
	Sets the limits by entering values in [Input low] and [Input high]. If	
	the value entered is outside the limits, the value in the register	
	cannot be changed.	
	Dynamic limits	
	Set the limits by a designated register, see Example 5.	
Use alarm	Low limit	
color	When the value in the register is outside the [Low limit], display	
	digits by the color set.	
	High limit	
	When the value in the register is outside the [High limit], display	
	digits by the color set.	
	Blink	
	When the value in the register is outside either limit, the digits flash	

13.9.2.1. The rule of using Macro Subroutine

• There must be a return value and exactly one parameter.

Examples:

```
sub char test (short a) // (Correct)
sub test (char a) // (Incorrect, no return value.)
sub char test (char a, char b) // (Incorrect, two parameters.)
```

Use the Macro data type that corresponds to the object's data format.

The mapping is as follows:

Macro Data Type	Numeric Object Data Format
short	16-bit Signed
Int	32-bit Signed



unsigned short	16-bit BCD, 16-bit HEX, 16-bit Binary, 16-bit Unsigned
unsigned int	32-bit BCD, 32-bit HEX, 32-bit Binary, 32-bit Unsigned
float	32-bit Float

For example, if the data format of the numeric object is 16-bit Unsigned, only the corresponding Macro data type: unsigned short, is available.

Examples:

sub char test(unsigned short a) // (Correct)
sub char test(char a) // (Incorrect)

Supports only the local HMI address.

Examples:

GetData(var, "Local HMI", LB, 0, 1) // (Correct)
GetData(var, "MODBUS RTU", 0x, 0, 1) // (Incorrect)

The following system defined functions are unable to be invoked:

ASYNC_TRIG_MACRO, SYNC_TRIG_MACRO, DELAY, FindDataSamplingDate, FindDataSamplingIndex, FindEventLogDate, FindEventLogIndex, INPORT, INPORT2, OUTPORT, PURGE, TRACE

• The following statements are not supported:

For-Next, While-Wend

Example 2

If [Interpolation] is selected, the scaling equation is as the following:

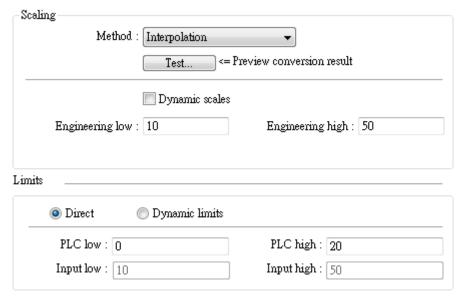
If A indicates the original data and B indicates the displayed data:

B = [Engineering low] + (A - [PLC low]) × ratio

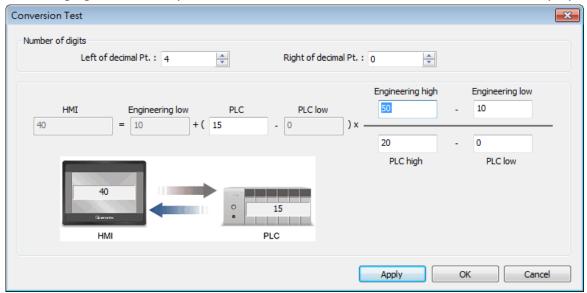
where, ratio = ([Engineering high] - [Engineering low]) / ([PLC high] - [PLC low])

As shown below, the original data is 15, after conversion, 40 will be displayed.





Click [Test] button to preview the result of Interpolation. Enter a value in [PLC] field as shown in the following figure, for example, enter value 15, and the result, which is 40, will be displayed.

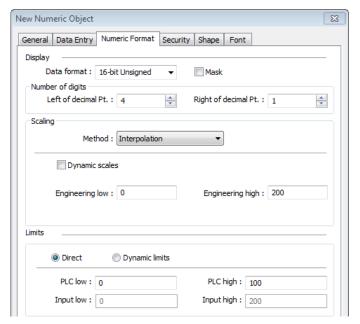


Example 3

If the numeric format selected is not Float and decimal point is used, the decimal place of the converted result will not be adjusted automatically, please adjust [Engineering high] to correctly place the decimal point of the result gained in [Interpolation] mode. Please see the illustration below.

1. Create two Numeric objects, set [Right of decimal Pt.] to 1 and select [Interpolation] method for one of the objects as shown in the following figure.

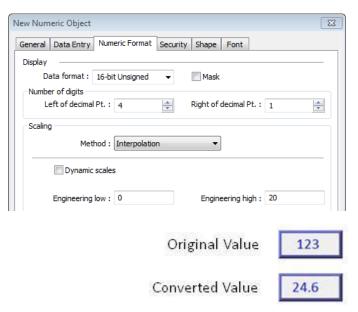




2. Enter value "123", the object set to [Interpolation] displays "246.0" instead of "24.6".



3. To move the decimal point one place to the left, adjust [Engineering high] as shown in the following figure.



Example 4

If [Interpolation] is selected, set the [Engineering low] and [Engineering high] by a designated register. When Dynamic Address is LW-n, where n is an arbitrary number, the rule of setting [Engineering low] and [Engineering high] is:



	Content	16-bit	32-bit
	Dynamic address	LW-n	LW-n
	Engineering low	LW-n	LW-n
	Engineering high	LW-n+1	LW-n+2
When address is LW-100, the rule of setting limits is:			
	Content	16-bit	32-bit
	Dynamic address	LW-100	LW-100
	Engineering low	LW-100	LW-100
	Engineering high	LW-101	LW-102

Example 5

Set the limits by a designated register. When [Address] is LW-n, where n is an arbitrary number, the rule of setting limits is:

16-bit	32-bit
LW-n	LW-n
LW-n	LW-n
LW-n+1	LW-n+2
	LW-n LW-n

When address is LW-100, the rule of setting limits is:

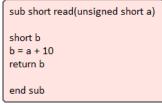
Content	16-bit	32-bit
Address	LW-100	LW-100
Low limit	LW-100	LW-100
High limit	LW-101	LW-102

Example 6

The following demonstrates how to use [Macro subroutine] for scaling when configuring Numeric object.

The following two macros are used, one for [Read conversion] and one for [Write conversion].

Read Conversion



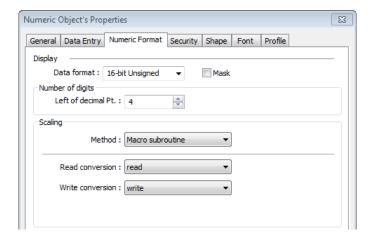
Write Conversion

sub short write(unsigned short a)
short b
b = a - 10
return b
end sub

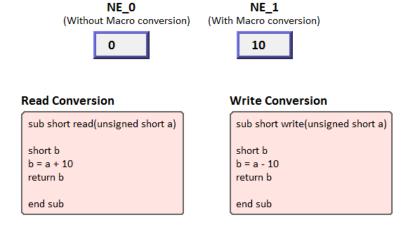
 Create two Numeric objects: NE_0 and NE_1 and use the same control address. Select [Macro subroutine] for NE_1.



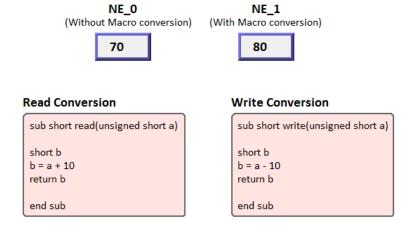




2. Enter 0 in NE_0 then NE_1 will execute [Read conversion]. The value gained will be 10.



Enter 80 in NE_1, [Write conversion] is executed and the value gained will be 70. NE_0 displays 70.



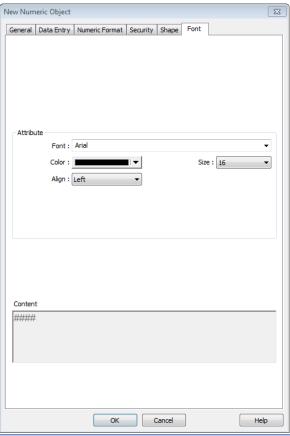


If executing [Read conversion] and [Write conversion] by the same numeric object, the value entered in this object is computed by the Macro subroutine of [Write conversion] first, and then the result is computed by the Macro subroutine of [Read conversion]. In



Example 5, if the subroutine of [Write conversion] is set to b=a-20, then entering 80 in NE_1 will get 60 after [Write conversion] and then the object displays 70 after [Read conversion].

Font Tab



Setting	Description		
Color	When the value is within the limits, display digits using color set in		
	this tab.		
Align	Left: Align the number to the left.		
	Center: Align the number to the center.		
	Right: Align the number to the right.		
	Leading zero: The number is preceded with leading zeros when the		
	number of digits is less than that set.		
	Left 66		
	Center 66		
	Right 66		
	Leading zero 0066		

Set the font size.



Size

13.10. ASCII

13.10.1. Overview

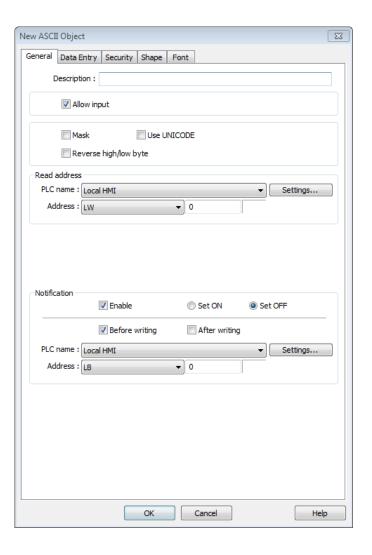
ASCII object can be used to input or display ASCII or UNICODE characters held in designated word registers.

13.10.2. Configuration



Click the ASCII icon on the toolbar to open an ASCII object property dialog box. Set up the properties, press OK button, and a new ASCII object will be created.

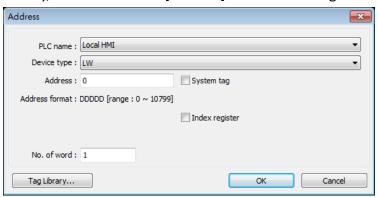
General Tab





Setting	Description
Allow input	If selected, the input features and relevant settings are enabled.
Mask	If selected, any values entered will be hidden by displaying them as ****.
Use UNICODE	Select this check box to display data in UNICODE format. If not selected, the characters are displayed in ASCII format. This feature can be used with the [Function Key] object that uses [ASCII/UNICODE].
Reverse high/low byte	Normally an ASCII code is displayed in "high byte", "low byte" order. Reverse selection makes the system display ASCII characters in "low byte", "high byte" order. ABCD BADC The left object is in normal form, and another is high/low byte reversed.
Read address	Click [Setting] to select the [PLC name], [Address], [Device type],

[System tag], [Index register] of the word device that displays characters. Users can select a defined address tag from Address Tag Library, or set address in [General] tab while adding a new object.



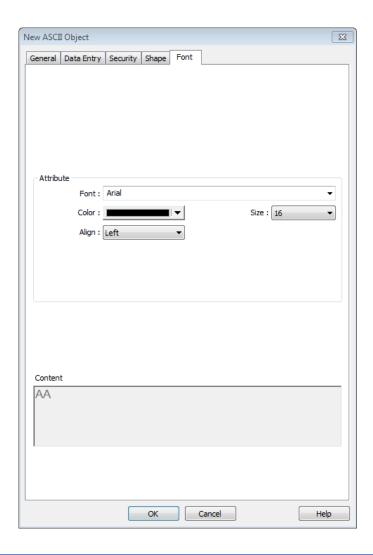
No. of words

Select the maximum number of words to be displayed.



An UNICODE character uses 1 word, and an ASCII character uses 1 byte. Therefore 1 word can be used as 1 UNICODE character or 2 ASCII characters. (1 word equals to 2 bytes)

Font Tab



Setting	Description
Attribute	The font, size, color, and alignment can be set.
	Align
	Left: Align the text to the left.
	Center: Align the text to the center.
	Right: Align the text to the right.



13.11. Indirect Window

13.11.1. Overview

Indirect Window object opens the pop-up window assigned by a designated word register. There are two ways to use Indirect Window object: The first is to use the profile of Indirect Window object, and let the pop-up window be resized and displayed in the defined profile; the second is to automatically resize the window according to the size of the pop-up window to be displayed. To close the pop-up window, assign 0 to the designated word register. The difference between Direct Window and Indirect Window is that Direct Window is controlled by a bit register, while Indirect Window is controlled by a word register.

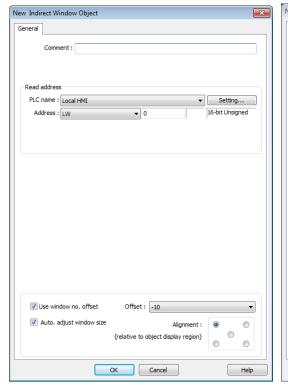
13.11.2. Configuration



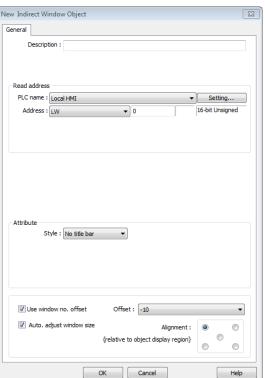
Click the Indirect Window icon on the toolbar to open the object property dialog box. Set up the properties, press OK button, and a new Indirect Window object will be created.

General Tab

cMT Series



eMT, iE, XE, mTV Series





Setting	Description	
Read address	Click [Setting] to select the [PLC name], [Address], [Device type],	
	[System tag], [Index register] of the word device that controls the	
	pop-up window. Users can also set address in [General] tab while	
	adding a new object.	
Attribute	Style	
	Set the display style of the pop-up window. There are two styles:	
	No title bar	
	The pop-up window has no title bar and cannot be dragged.	
	WINDOW 11	
	With title bar	
	The pop-up window has a title bar that can be dragged to move the	
	window.	
	WINDOW 11	
Use window	Sets the offset of the window number for selecting the pop-up	
no. offset	window. The window number of the pop-up window is calculated	
	by the value in the word register added to the offset. For example,	
	assume the value in the register is 20 and offset is 5, the pop-up	
	window number will be 25.	
Auto. adjust	Automatically resize the Indirect Window and align the pop-up	
window size	window to the preset region.	
	Alignment	
	Sets a reference point of the pop-up window from one of the five	
	positions on the screen. For example, if the lower-right region is	
	selected, the lower-right corner of the pop-up window is aligned to	
	· · · · ·	

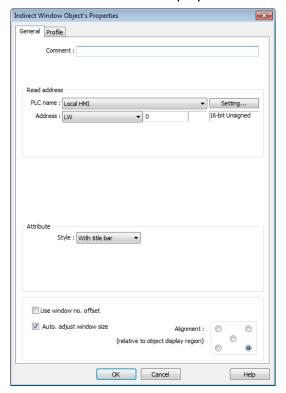
Example 1

Here is an example of using Indirect Window. The setting is shown in the following figure, set the address to LW-0 which assigns the window number. Create window no. 11 and 12 first.

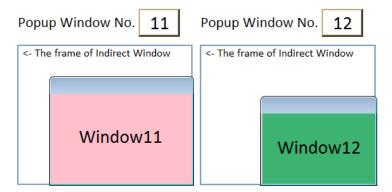
 Create an Indirect Window object, set address to LW-0, and select [Auto. adjust window size].



2. Select the region where the window is to be displayed.



- 3. Enter value 11 in LW-0, the pop-up window displayed is window no. 11.
- 4. Enter value 12 in LW-0, the pop-up window displayed is window no. 12.
- 5. Enter value 0 in LW-0, the pop-up window is closed.



To close the pop-up window, apart from entering 0 in the designated word register, another way is to place a Function Key object in the pop-up window, and set the key to [Close window].



- At most 24 windows can be displayed simultaneously at run time.
- The system does not allow opening the same window with two Direct (or Indirect) windows in one base window.
- If the pop up window has monopoly property enabled, then when the window pops up, all background windows may not be operated until the monopolizing window has been closed.



13.12. Direct Window

13.12.1. Overview

Direct Window object defines the position and size of a pop-up window location on a window. When the content of the bit register is changed, the window will pop up at the predefined location. The display area for the pop-up window is limited by the size of predefined location. Restoring the value of the bit register closes the pop-up window. The difference between the Direct Window and the Indirect Window is that Direct Window object has a predefined window number, and is controlled by a bit register, while Indirect window is controlled by a word register, and the value of the word register determines the window displayed.

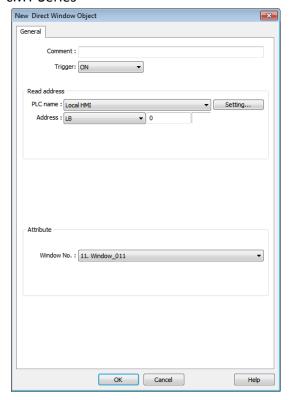
13.12.2. Configuration



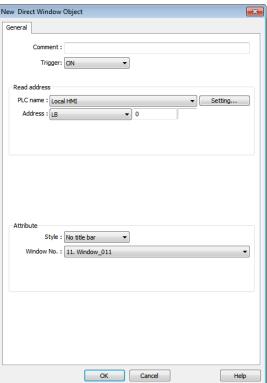
Click the Direct Window icon on the toolbar to open a Direct Window object property dialog box. Set up the properties, press OK button, and a new Direct Window object will be created.

General Tab

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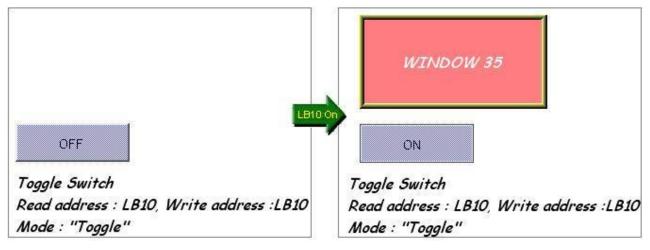
Setting	Description
Read address	Click [Setting] to select the [PLC name], [Device type], [Address],
	[System tag], [Index register] of the bit device that control the
	window popup. Users can select a defined address tag from
	Address Tag Library, or set the address in [General] tab while
	adding a new object.
Attribute	Style
	Define the pop-up window style. Two styles are available, [No title
	bar] and [With title bar].
	Window no.
	Set the pop-up window number.

Example 1

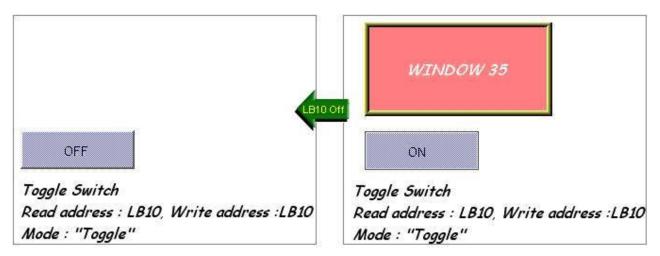
Here is an example to explain how to use the Direct Window object. The following figure shows the settings of the Direct Window object. In the example, use LB-10 to call up window no. 35.



If the state of LB-10 turns to ON, window no. 35 will pop up; if the state of LB-10 turns to OFF, window no. 35 will be closed, as shown in the following figure.









- A screen can simultaneously display up to 24 pop-up windows including System Message Window, Direct Window and Indirect Window.
- The system does not allow opening the same window with two Direct (or Indirect) Windows in one base window.
- If the pop up window has monopoly property enabled, then when the window pops up, all background windows may not be operated until the monopolizing window has been closed.



13.13. Moving Shape

13.13.1. Overview

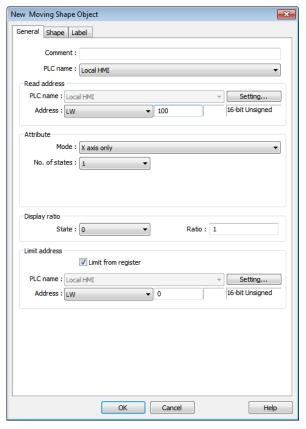
Moving Shape object defines the states and moving distance of an object. The state and the location of the object depend on consecutive registers.

13.13.2. Configuration



Click the Moving Shape icon on the toolbar to create a Moving Shape object. Set up the properties, press OK button, and a new Moving Shape object will be created.

General Tab



Setting	Description
Read address	Click [Setting] to configure the [PLC name], [Device type],
	[Address], [System tag], or [Index register] of the word devices that
	control the display of object's state and moving distance. Users can



	also set the address in [General] tab while adding a new object.			
Attribute	Select the object's movement mode and range. See "13.13.2.1			
	Illustration of Modes" in the following part.			
Display ratio	The size of shape in different states can be set individually as			
	shown in the following figure.			
	Ratio : 1 Ratio : 1.2 Ratio : 1.4 Ratio : 1.6			
	State 0 State 2 State 3			
Limit address	The object's moving range can be set by adjusting the data in the			
	designated register, see Example 1.			

Example 1

Supposed that the object's moving range is limited by register LW-n, the addresses in the following table are used to limit the moving range.

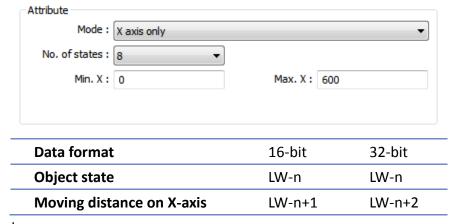
Data format	16-bit	32-bit
[Min. X] address	LW-n	LW-n
[Max. X] address	LW-n+1	LW-n+2
[Min. Y] address	LW-n+2	LW-n+4
[Mas. Y] address	LW-n+3	LW-n+6

13.13.2.1. Illustration of Modes

Available modes are: (Assume Read Address is LW-n)

X axis only

The object is only allowed to move along the X-axis. The moving distance ranges from [Min. X] to [Max. X].



Y axis only

The object is only allowed to move along the Y-axis. The moving distance ranges from [Min. Y] to [Max. Y].





Data format	16-bit	32-bit
Object state	LW-n	LW-n
Moving distance on Y-axis	LW-n+1	LW-n+2

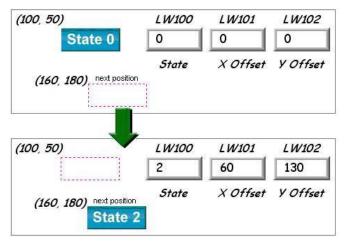
X & Y axis

The object is allowed to move along the X-axis and Y-axis. The moving range in X and Y directions is defined by [Min. X], [Max. X] and [Min. Y], [Max. Y] respectively.



Data format	16-bit	32-bit
Object state	LW-n	LW-n
Moving distance on X-axis	LW-n+1	LW-n+2
Moving distance on Y-axis	LW-n+2	LW-n+4

For example, if the object's read address is LW-100 and the data format is [16-bit Unsigned], LW-100 is used to control the object's state, LW-101 is used to control the object's moving distance on the X-axis, and LW-102 is used to control the object's moving distance on the Y-axis. The following figure shows that the object's read address is LW-100 and initial position is (100, 50). To move the object to the position (160,180) and change its state to State 2, assign 2 to LW-100, 160-100 = 60 to LW-101, 180-50 = 130 to [LW102].





X axis w/ scaling

The object moves in X-axis only with scaling. Suppose that the value of the designated register is DATA, the system uses the following equation to calculate the moving distance on the X-axis.

$$\label{eq:Displacement} \begin{aligned} & \text{Displacement=(Data-[Input low])} \times \frac{\text{[Scaling high]-[Scaling low]}}{\text{[Input high]-[Input low]}} \end{aligned}$$

Data format	16-bit	32-bit
Object state	LW-n	LW-n
Moving distance on X-axis	LW-n+1	LW-n+2

Y axis w/ scaling

The object is for Y axis movement with scale, and the equation to calculate the moving distance on the Y-axis is the same as the one in [X axis w/ scaling].

Data format	16-bit	32-bit
Object state	LW-n	LW-n
Moving distance on Y-axis	LW-n+1	LW-n+2

X axis w/ reverse scaling

This works in the way as [X axis w/ scaling], but the moving direction is in reverse.

Y axis w/ reverse scaling

This works in the way as [Y axis w/ scaling], but the moving direction is in reverse.



13.14. Animation

13.14.1. Overview

Animation object is defined by a pre-defined point set and states. Animation object will then move to a given point in a given state defined by designated registers. The object state and position depend on current value of two consecutive registers. The first register controls the state of the object and the second register controls the position along the predefined path.

13.14.2. Configuration

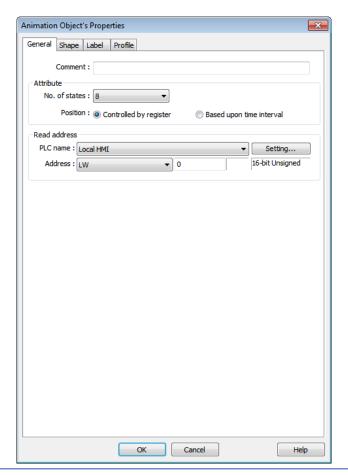


Click the Animation icon on the toolbar. First, create the pre-defined path. Move the mouse to each moving position, and click the left button to define positions one by one. When it is done, right click on the screen, set up the properties, press OK button, and a new Animation object will be created.



To change the object's attributes, double click on the object to open Animation Object's Properties dialog box.

General Tab



Setting

Description

Attribute

No. of states

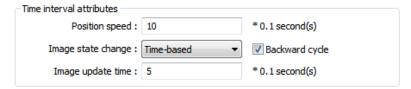
Configure the number of states for this object.

Controlled by register

Use the designated registers to control the object's state and position. See Example 1.

Based upon time interval

The object's state and position will change from time to time. [Time interval attributes] is used to set the time interval for states and positions.



Position speed: The speed of movement. The unit is 0.1 second. Supposed that [Speed] is set to 10, the object's position will change each second.



Image state change: Determines how state changes, either [Position dependent] or [Time-based]. If [Position dependent] is selected, the object state will change when position changes. If [Time-based] is selected, the object position will change based on [Position speed] and the object state will change based on [Image update time].

Backward cycle: Assumed the object has four positions: position 0, position 1, position 2, and position 3, and [Backward cycle] is not selected. When the object moves to the last position (position 3), the next position will be back to the initial position 0, and repeat. The moving path is shown as follows:

position $0 \rightarrow$ position $1 \rightarrow$ position $2 \rightarrow$ position $3 \rightarrow$ position $0 \rightarrow$ position $1 \rightarrow$ position 2...

If [Backward cycle] is selected, when the object moves to the last position (position 3), it will move backwards to position 2, position 1 and then the initial position 0, and start over again. The moving path is shown as follows.

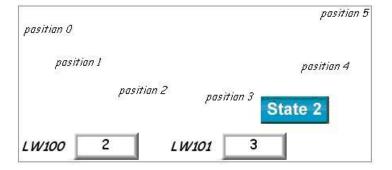
position $0 \rightarrow$ position $1 \rightarrow$ position $2 \rightarrow$ position $3 \rightarrow$ position $2 \rightarrow$ position $1 \rightarrow$ position 0...

Example 1

The object's state and position are determined by the registers, and the addresses must be configured correctly, as in the following table:

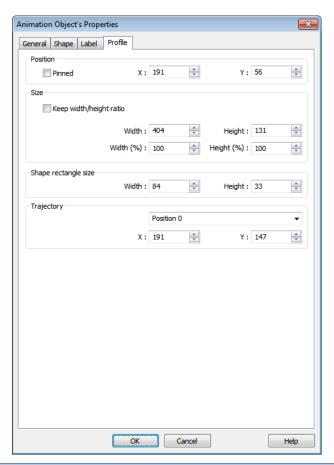
Data format	16-bit	32-bit
Object state	LW-n	LW-n
Object position	LW-n+1	LW-n+2

For example, if the designated register is LW-100 and the data format is [16-bit Unsigned], then LW-100 represents object's state, LW-101 represents position. In the picture below, LW-100 = 2, LW-101 = 3, so the object's state is 2 and position is 3.





Profile Tab



Setting	Description
Shape rectangle size	Set the size of the shape.
Trajectory	Set the position of each point on the moving path.



Since multiple pictures might be used by an [Animation] object, [Set to original dimension] will not return all pictures to the original size.

13.15. Bar Graph

13.15.1. Overview

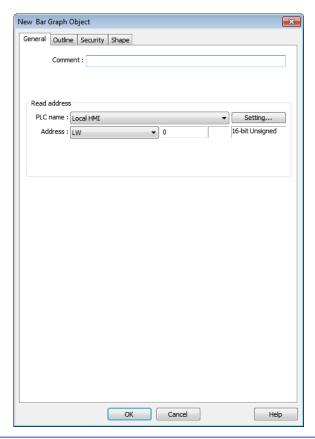
Bar Graph object displays data as a bar graph for visualization.

13.15.2. Configuration



Click Bar Graph icon on the toolbar to open Bar Graph dialog box. Select properties, click OK button, a new Bar Graph object is created.

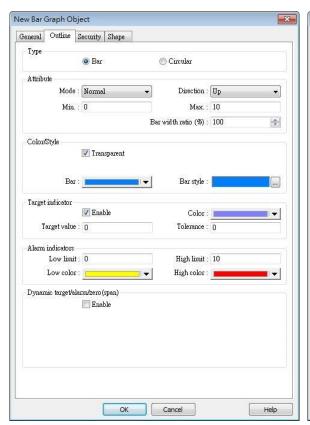
General Tab

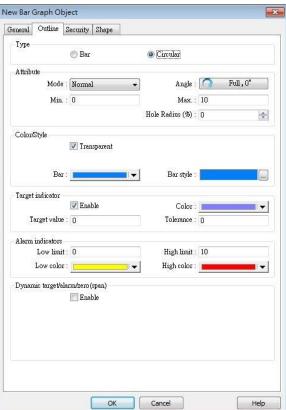


Setting	Description
Read address	Click [Setting] to Select the [PLC name], [Device type], [Address],
	[System tag], and [Index register] of the word devices that controls
	how the bar graph displays.



Outline Tab





Setting

Description

Type

Choose either [Bar] or [Circular].

Attribute

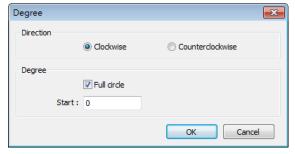
Mode

Choose either [Normal] or [Offset]. If [Offset] is selected, an original value [Origin] must be entered for reference.

Direction / Degree

Bar: Determine the bar graph direction. Available options are [Up], [Down], [Right], and [Left].

Circular: Determine the circular bar graph direction. Available options are [Clockwise] and [Counter clockwise].



If [Full circle] is selected, set the start degree.

If [Full circle] is not selected, set the start and end degree.

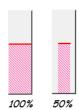


Zero / Span

The percentage of filling can be calculated by the formula, see Example 1.

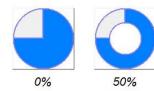
Bar width ratio (%)

The ratio of bar to object width. The figure below shows two ratios, 100% and 50%.



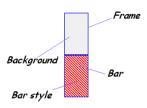
Hole Radius (%)

The ratio of the radius of the hole to the radius of the whole circular bar graph. The figure below shows two ratios, 0% and 50%.



Bar color/style

Set the bar's frame and background color, bar style, and bar color. See the picture below.



Target indicator	When the register value meets the condition, the color of filled area will change to the target color, see Example 2.
Alarm indicators	If the register value is larger than [High limit], the color of filled area will change to [High color]. If the register value is smaller than [Low limit], the color will change to [Low color].
Dynamic taget/alarm /zero(span)	When [Enable] is selected, the [Low limit] and [High limit] of [Alarm indicator] and the [Target Value] of [Target indicator] will use designated registers, which is shown in their respective fields see Example 3.



Example 1

The percentage of filling can be calculated by the following formula:

Percentage of filling =
$$\frac{\text{Register value} - [\text{Zero}]}{[\text{Span}] - [\text{Zero}]} \times 100\%$$

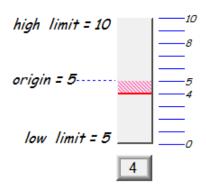
Assume [Offset] is selected. If (Register value – [Zero]) is greater than 0, the bar will fill up from [Origin]. If (Register value – Zero) is less than 0, the bar will be drawn below [Origin].

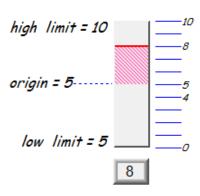
For example, [Origin] is 5, [Span] is 10, and [Zero] is 0.

For different value in read address, it will display as below:

If the value at read address is 4:

If the value at read address is 8:





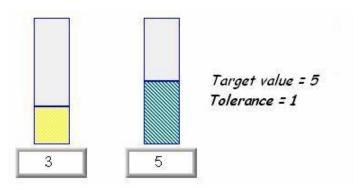


Example 2

When the register value meets the following condition, the color of filled area will change to the target color.

[Target Value] - [Tolerance] ≤ Register value ≤ [Target Value] + [Tolerance]

Assume [Target Value] is 5 and [Tolerance] is 1. As shown below, if the register value is equal to or larger than 4 (=5-1) and equal to or less than 6 (=5+1), the filled area's color of the bar will change to the target color.



Example 3

If [Dynamic target/alarm] is enabled, [Low limit] and [High limit] of [Alarm indicator] are defined by designated registers as shown in the following table. Furthermore, if [Dynamic zero/span] is used, [Zero], [Span] and [Origin] will be defined by designated registers. Assume the address is LW-n, the limits are:

Data format	16-bit	32-bit
Alarm Low Limit	LW-n	LW-n
Alarm High Limit	LW-n+1	LW-n+2
Target	LW-n+2	LW-n+4
Zero	LW-n+3	LW-n+6
Span	LW-n+4	LW-n+8
Origin	LW-n+5	LW-n+10



13.16. Meter Display

13.16.1. Overview

Meter Display object displays the value of word register with a meter.

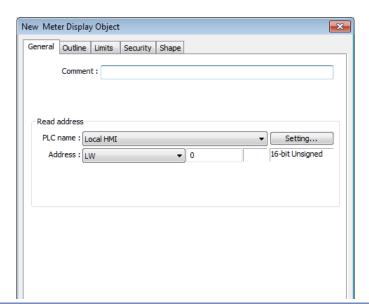
13.16.2. Configuration



Click the Meter Display icon on the toolbar to open the Meter Display dialog box. Set the object's attributes and then click OK to create a new Meter Display object.

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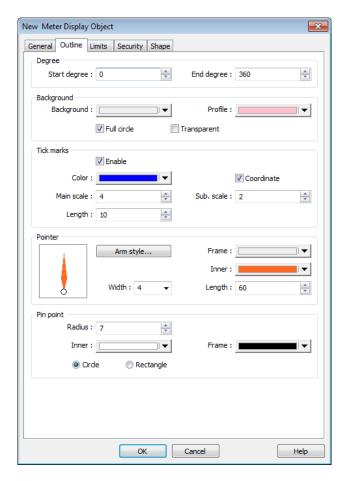
General Tab

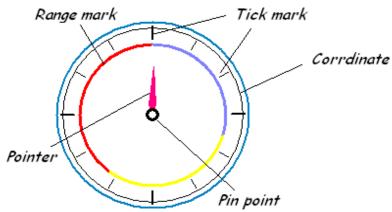


Setting	Description
Read address	Click [Setting] to select the [PLC name], [Device type], [Address],
	[System tag], and [Index register] of the word devices that controls
	the Meter Display object.



Outline Tab

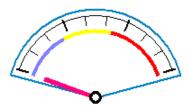




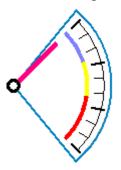
Setting	Description
Degree	Sets the object's start degree and end degree measured clockwise
	from the 12 o'clock position. The angle range is 0 to 360 degrees.
	The following shows meters of different settings.



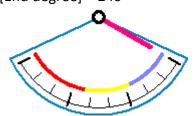
• [Start degree] = 290° [End degree] = 70°



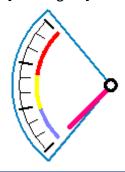
• [Start degree] = 40° [End degree] = 140°



• [Start degree] = 120° [End degree] = 240°



[Start degree] = 225° [End degree] = 315°

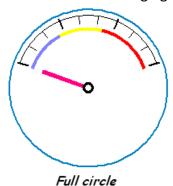


Background

Sets the object's background color and profile color.

Full circle

When selected, the object will display the whole circle. Otherwise, the object will only display a partial circle in the defined degree range, as shown in the following figure.





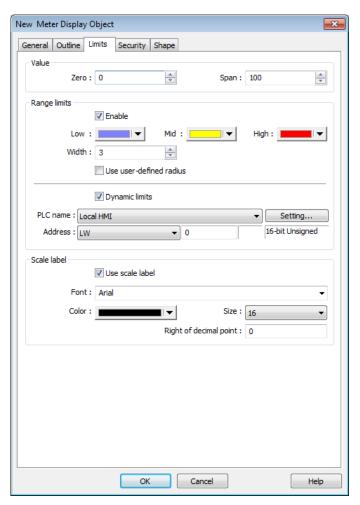
Transparent

When selected, the object will not display the background and profile color.

Tick marks	Configures the number of tick mark and color.	
Pointer	Pointer Configures pointer's style, length, width, and color.	
Pin point Configures the style, radius, and color of the pin point.		



Limits Tab



Value Sets the object's display range. Meter Display object will use the value of [Zero] and [Span] and the value of register to calculate the pointer's position. See Example 1. Range limits Configures the values of [Low limit], [High limit], their corresponding display colors, and the width.



Use user-defined radius

Configures the radius to display range limits.

For example, set to 80: Set to 30:







Dynamic Limits

The low limit and high limit are set by registers. See Example 2.

Scale label

Select the attribute of scale label on Meter Display.





Example 1: Pointer position calculation

Set object's display range. Meter Display object will use the value of [Zero] and [Span] and the value of register to calculate the pointer's position. For example, supposed that [Zero] is 0, [Span] is 100, when the value of register is 30, [Start degree] is 0, and [End degree] is 360, then the degree indicated by the pointer is:

 ${ (30 - [Zero]) / ([Span] - [Zero]) } * ([End degree] - [Start degree]) = {(30 - 0) / (100 - 0)} * (360 - 0) = 108$

Pointer will be pointing at 108 degrees.

Example 2: Dynamic Limits

The low limit and high limit are set by the register.

Suppose the address is LW-n, the following table shows the read address of low limit and high limit:

Content	16-bit	32-bit
Low limit	LW-n	LW-n
High limit	LW-n+1	LW-n+2

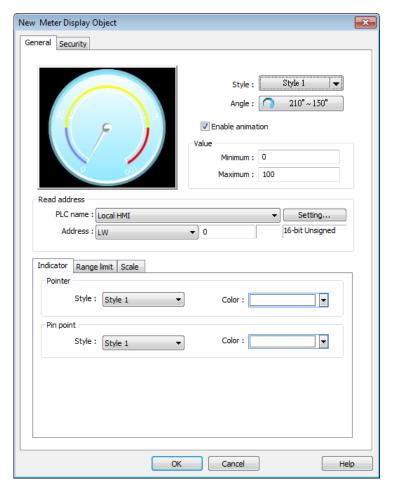
For instance, when address is LW-100, the rule of setting limits is:

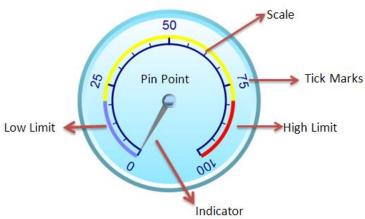
Content	16-bit	32-bit
Low limit	LW-100	LW-100
High limit	LW-101	LW-102



13.16.2.2. cMT Series

General Tab



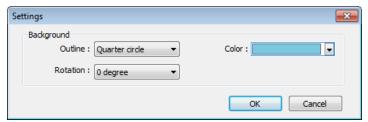


Setting	Description
Style	Three options are available: [Custom], [Style 1], and [Style 2]. Click
	on the text to configure the properties. If [Custom] is selected, set
	the properties such as [Pointer], [Pin point], [Background picture],
	etc.



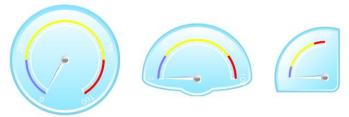
Setting

Click the button of [Style 1] or [Style 2] to set the style of meter.



Outline

The following is the outline of Style 1 when [Full circle], [Half circle], or [Quarter circle] is selected.



The following is the outline of Style 2 when [Full circle], [Half circle], or [Quarter circle] is selected.







Rotation

Rotates the background picture clockwise according to the angles set.

Color

	Sets the color of the background picture of meter.	
Angle	Sets the range to label the scale, 0° to 360° clockwise or	
	counterclockwise from the twelve o'clock position.	
	Full circle	
	If selected, the full circle is drawn according to the selected	
	direction and the start angle. The limits are determined by the	
	value set in [Minimum] and [Maximum] field under [Value].	
Enable	If selected, the pointer slides to the designated position when the	
animation	read value changes; if not selected, the pointer directly points to	
	the designated position when the read value changes.	
Value	Sets the lower and upper limits of the meter.	
Read address	Displays the value in meter according to the value in the designated	
	word register.	
Indicator	Sets the style of pointer and pin point. If [Custom] is selected, the	
	direction of the pointer must points upward to correctly display.	



Range limit	Sets the colors to indicate different ranges.		
	Dynamic limits		
	The low limit and high limit are decided by the register. See		
	Example 2 above.		
Scale	Sets the number of main and sub scale, the color of tick marks and		
	scale label.		



13.17. Trend Display

13.17.1. Overview

Trend display objects draw curves of the data recorded by Data Sampling object.

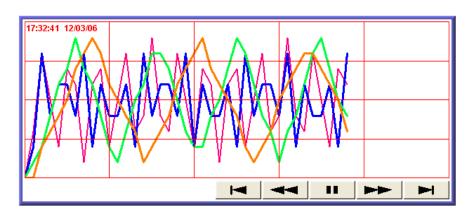
13.17.2. Configuration



Click the Trend Display icon on the toolbar to open a Trend Display object property dialog box. Set up the properties, press OK button, and a new Trend Display object will be created.

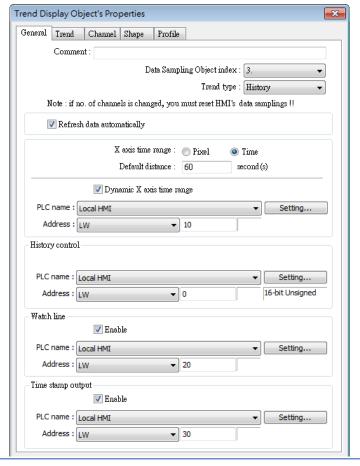
13.17.2.1. eMT, iE, XE, mTV Series

General Tab



Button	Description
 ←	Go to the earliest sampling data.
-	Go to the previous time interval.
	Click to stop auto-scrolling. When the new sampling data is
	generated, the display does not scroll, nor is the new data outside
	the display range displayed.
-	Click to start auto-scrolling. The display scrolls as the new sampling
	data is generated.
	Go to the next time interval.
▶ -I	Go to the latest sampling data.





Setting

Description

Data

Sampling

Object index

Select a Data Sampling object as the source data.

Trend type

Select the mode of data source, either [Real-time] or [History].

Real-time

In this mode, the display object shows all sampled data since the HMI started. The maximum number of records that can be sampled is set in [Max.data records] (Real-time mode) of the Data Sampling object. When the sampling data exceed this setting, the earlier data will be deleted. To show older data, use [History] mode. [Hold control]: Suspends the update of Trend Display. However, It does not stop the sampling process of Data Sampling object.

History

In this mode, the data comes from the history data files stored on HMI. . The history data files are sorted by dates and each is given an index. The system uses [History control] to select the history data files that are created on different dates.

The system sorts the history data of sampling data by date; the



latest file is record 0 (typically the data sampled today), the second latest file is record 1, and so on. If the value of designated register in [History control] is n, the Trend Display object will display data record n.

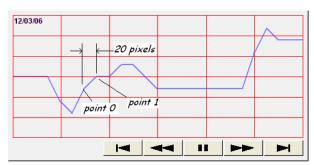
Here is an example to explain [History control]. If the designated register is LW-0, and the sampling data files available are pressure_20061120.dtl, pressure_20061123.dtl, pressure_20061127.dtl, and pressure_20061203.dtl, and it is 2006/12/3 today, based on the value of LW-0, the sampling data file which will be selected by [Trend Display] is shown as follows:

Value of LW-0	Selected sampling history data
0	pressure_20061203.dtl
1	pressure_20061127.dtl
2	pressure_20061123.dtl
3	pressure_20061120.dtl

If use with Option List object and select data source as [Dates of historical data], the history data will be sorted by date and displayed in Option List object, see "13.29 Option List".

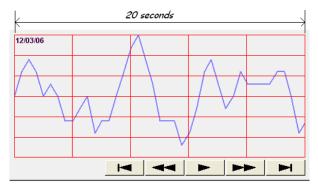
Pixel

[Distance] is used to set the distance between two sampling points, as shown in the following figure.



Time

[Distance] is used to set the X-axis in unit of time, as shown in the following figure.

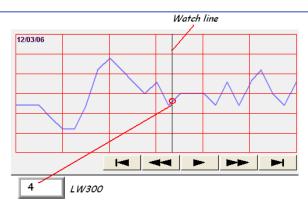


Select [Time] for [X axis time range] and go to [Trend] » [Grid] and



	enable [Time scale]. Please refer to [Time scale] in the later section.	
Dynamic distance between data samples/ Dynamic X axis time range Refresh data automatically	Designate a 32-bit word register for adjusting the distance between two sampling points (select Pixel), or the time unit represented by X-axis (select Time). If no value is entered, the default value will be used. If selected, every time when opening the window on which the Trend Display object in history mode is placed, the display is automatically refreshed once per second. Please note that: The refresh status can be observed from the control button of Trend Display object. Showing button: The automatic refresh feature is enabled. Showing button: The automatic refresh feature is disabled. When scrolling to the previous data, the automatic refresh feature is disabled, the button is shown. If [Refresh data automatically] check box is selected, when change back to the window, the display is refreshed, ignoring the control buttons. For example, select [Refresh data automatically], and scroll to the previous data, the automatic refresh feature is disabled. In this case, changing to another window and then change back will still refresh the display. If [Refresh data automatically] check box is not selected when	
	-	
Hold control	When the register is set ON, suspend the update of Trend Display. It does not stop the sampling process of Data Sampling object. This setting is available only in Real-time mode.	
Watch line	Use the [Watch line] function to display a "watch line" when user touches the Trend Display object. It will also export the sampling data at the position of watch line to the designated word device and use Numeric objects to display the results, as shown in the following figure.	





[Watch line] can also export sampling data with multiple channels. The system will consecutively write each channel to the specified address and the following addresses, in the same order as in [Data Sampling] object. The address assigned to [Watch line] is the start address, and sampling data for each channel will be exported to the word devices starting from "start address." If the data format of each channel is different, the corresponding address of each channel is arranged from the first to the last. If the watch register is LW-300, watch function will export each channel's data to the following addresses:

Register	Channel	Data format
LW-300	0	16-bit Unsigned (1 word)
LW-301	1	32-bit Unsigned (2 words)
LW-303	2	32-bit float (2 words)
LW-305	3	16-bit Signed (1 word)

Time stamp output

Time stamp output

Suppose the address is set to LW-n, then:

If enabled, the system will use the time of the first sampling data as "time origin", and write the time stamp of the most recent sampled data (relative to "time origin") to [LW-n+2].

When clicking on the curve, the time stamp of the closest sampled point will be written to [LW-n].

Clear real-time data address (Data Sampling object) will clear the time origin as well.

Time stamp is recorded in seconds.

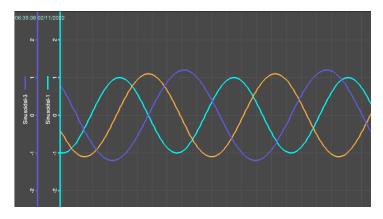


- LW-n and LW-n+2 are both in 32-bit format.
- LW-n is for both real-time and history mode, whereas LW-n+2 only applies to real-time mode.
- This function is available upon enabling [relative time mode] in [Trend] tab.

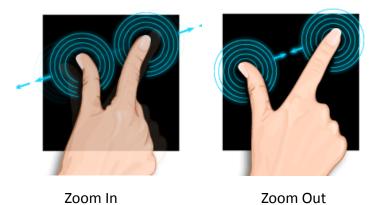


13.17.2.2. cMT Series

General Tab

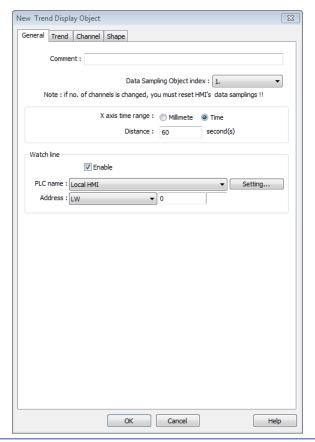


The Trend Display on cMT Series combines Real-time mode and History mode. Drag left to scroll the Trend Display to view history data and drag right to view the latest sampling data. Pinch two fingers together to zoom out Trend Display or spread them apart to zoom in.



For more information about how sampling data is saved, see "8 Data Sampling".





Setting	Description
Data	
Sampling	Select a [Data Sampling] object as the source data.
Object index	
Millimeter	See 13.1.2.1.
Time	See 13.1.2.1.
Watch line	See 13.1.2.1.



Trend Tab



Frame / Background Show scroll controls Description Select the color of frame and background. Enable or disable the scroll control as shown in the following figure.

Grid

Set the number of dividing lines and the line color. The number of divisions depends on the setting in General tab.

X-axis interval

The number of vertical grid lines.

Select [Pixel] / [Millimeter] in General tab:

Select how many sampling point will be included between two vertical grid lines.

Select [Time] in General tab:

Select the time range between two vertical grid lines.

Y-axis interval

The number of horizontal grid lines.



Time scale

Select [Enable] check box to display the time scale along the x axis.



Format

The available time scale formats: HH:MM or HH:MM:SS.

Font / Color / Size

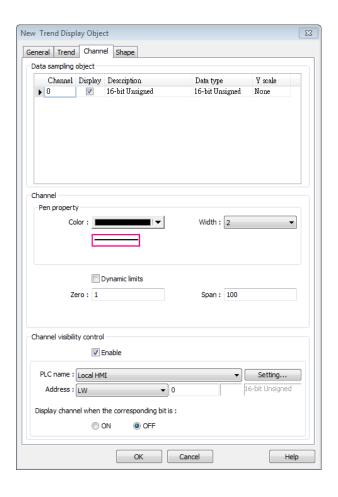
Select the font, font color, and font size of the time scale.

The default font size is 8.

Time / Date

The time of latest sampling data will be marked on the top left corner of the object. This group box is used to set the time display format and font color.

Channel Tab





Setting	Description					
Y scale	Set Y-axis to	be Main Axis	or Aux. Axis. See	"Y Scale Tab	" for more	
	information					
	Channel I	Display Descript			Y scale	
		rue channel		Unsigned	Aux. Axis	
		rue channel l rue channel (Unsigned Unsigned	Main Axis Aux. Axis	
Channel	Configure e	ach sampling	line's format and o	color. At mo	st 64	
	channels co	uld be configi	ured.			
	Dynamic lin	nits				
	Not se	lected:				
	[Zero] and [Span] are use	d to set the low lir	nit and high	limit of	
	sampling da	ta. If the low	limit is 50 and the	high limit is	100 for on	
	sampling lin	e, [Zero] and	[Span] must be se	t as [50] and	d [100], so	
	that all the sampling data can be displayed in the trend display					
	object.					
	Selected					
	The low limi	it and the hig	h limit are read fro	m the desig	nated word	
		_	When address is I	_		
	address:			,		
	Da	ata Format	16-bit	32-bit		
	Lo	w limit	LW-n	LW-n		
	Hi	gh Limit	LW-n+1	LW-n+	2	
	For example, if LW-100 is used here, the low limit and the high limit					
	will be read	from:				
	Da	ata Format	16-bit	32-bit		
	Lo	w limit	LW-100	LW-10	0	
	Hi	gh Limit	LW-101	LW-10	2	
	A typical usage of this is to zoom in and zoom out of Trend Display.					
	(Not available for cMT Series). See Example 1.					
	If [Enable] is selected, the bits of the assigned word register will be					
Channel	ii [Liidbic] is		used to show/hide each channel. The first bit controls the first			
Channel visibility		w/hide each o	channel. The first b	oit controls t	the first	
	used to sho		channel. The first be the se			
isibility/	used to sho channel, an	d the second		cond chann	el, and so	

Control Bit

LW_bit-000



are:

Channel

1

Displayed

YES

State

OFF

2	LW_bit-001	ON	NO
3	LW_bit-002	ON	NO
4	LW_bit-003	OFF	YES
5	LW_bit-004	OFF	YES

Note on using this feature: Each control bits are not reserved for the channel. If a particular channel is not displayed, the control bit is assigned to the next displayed channel. For example, if the third channel of the 5 channels is not displayed, only 4 channels will be displayed in Trend Display, and the used control bits will only be: LW_bit-000~003.

Example 1

The example explains how to zoom in or zoom out Trend Display. The feature described is not available for cMT Series.

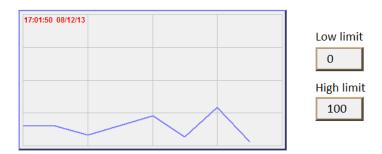
In Channel tab select [Dynamic limits] check box. If the [Address] is set to LW-n, then LW-n controls the low limit where LW-n+1 controls the high limit.



Set [Address] to LW-0 and create two Numeric objects for entering the low / high limit. The address that controls the low limit is LW-0; the address that controls the high limit is LW-1. Let's suppose the data is between 0 and 30; set the [Low limit] to 0 and the [High limit] to 30, the trend curve is displayed as shown in the following figure.

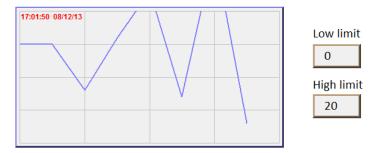


To zoom out the Trend Display, enter a value greater than 30 in [High limit] as shown in the following figure.



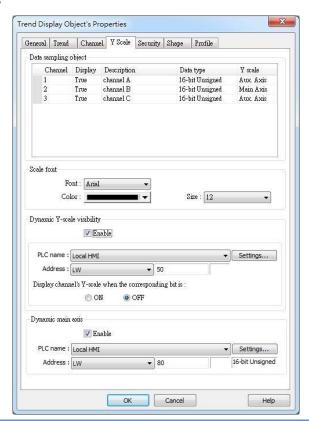


To zoom in the Trend Display, enter a value less than 30 in [High limit] as shown in the following figure.



Y Scale Tab

eMT, iE, XE, mTV Series



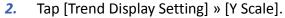
Setting	Description		
Y scale	Set Y-axis to be Main Axis or Aux. Axis, or set none to hide Y-axis.		
Scale font	Select the font, font color, and font size of the scale.		
Dynamic	To show or hide Y-scale. If the control address is LW-50, then the		
Y-scale	first axis is controlled by LW_Bit 5000, and the second axis is		
visibility	controlled by LW_Bit 5001, and so on.		
Dynamic	To change the main axis. If writing 1 into LW-80, the main axis will		
main axis	be Channel 1; if writing 2 into LW-80, the main axis will be Channel,		
	and so on.		



cMT Series

The scale along the Y axis of a specific channel can be displayed. To enable Y Scale, [Grid] should first be enabled in [Trend] tab. Y Scale can be configured on the iPad as shown in the following steps.

1. Tap the button on the upper right corner of Trend Display object.





3. Select the channels.





13.18. History Data Display

13.18.1. Overview

History Data Display object displays data stored by Data Sampling object. It differs from Trend Display in that History Data Display object uses a table to display data. In case when the trend display shows history data from today, the display will refresh once per second. The following is an example of a history data display object.

No.	Time	Date	Ch.0	Ch.1	Ch.2▲
3577	21:52	16/09/07	0	0	0
3576	21:52	16/09/07	0	0	0
3575		16/09/07	0	0	0
3574	21:52	16/09/07	0	0	0
3573	21:52	16/09/07	0	0	0
		16/09/07	0	0	0
3571	21:52	16/09/07	0	0	0
3570	21:52	16/09/07	0	0	0
3569		16/09/07	0	0	0
3568	21.52	16/00/07	0	n	<u>∩</u> _▼
1					▶

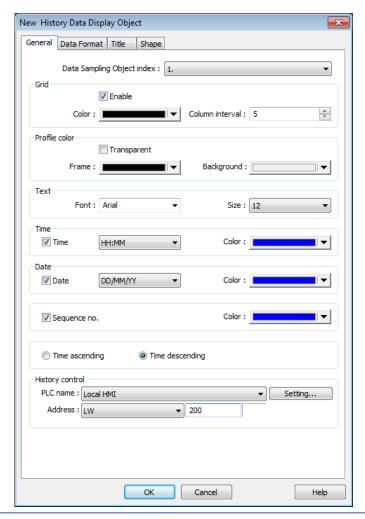
13.18.2. Configuration



Click the History Data Display icon on the toolbar to open a History Data Display object property dialog box. Set up the properties, press OK button, and a new History Data Display object will be created.



General Tab



Data Sampling object index

Description

Select a Data Sampling object as the source data.

Grid

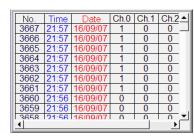
Shows grids between rows and columns.

Color

Change the color of grids.

Column interval

Change the width of each column. The figures below are the examples.







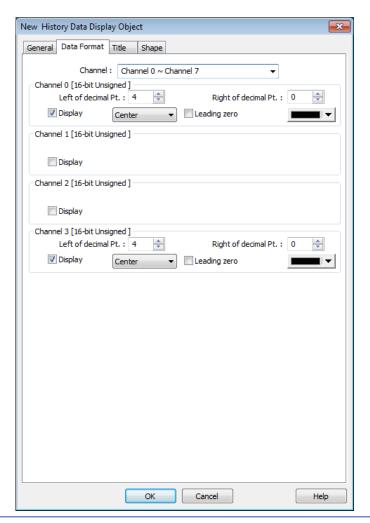
Profile color	Change the color of frame and background. Use [Transparent] to		
	hide frames and background.		
Time / Date	<u> </u>		
Time / Date	Enable or disable showing the time and date and configure its		
	format.		
	Time ascending		
	Put earlier data at the top and the latest data at the bottom.		
	Time descending		
	Put the latest data at the top and the earlier data at the bottom.		
History Control	The history files are sorted by date and each file is given an index.		
(eMT, iE, XE,	The latest one is assigned index 0 (in most cases: today), the		
mTV Series)	second latest file is assigned index 1, and so on. [History Control] is		
	used to specify the history data to be shown.		



■ When using cMT-SVR, use the filter icon in the upper-right corner of History Data Display object on iPad to select the date and display the data.



Data Format Tab



Setting

Description

Channel

Each History Data Display object can display up to 64 channels. Check [Display] to select the channels to be shown on the screen. In the figure above, there are 4 channels (channel 0 to channel 3) in the Data Sampling object, and only Ch.0 and Ch.3 are selected. The data formats are shown next to channel name. The data format of each channel is decided by the corresponding Data Sampling objects. The result is shown below:



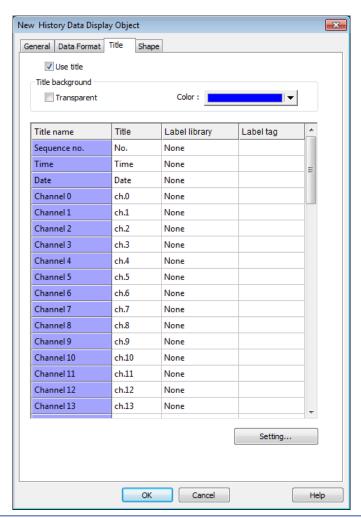
When display [String] format in History Data Display object, there are two additional options:





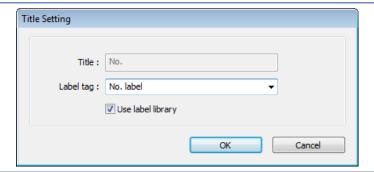
- Display in [UNICODE] mode
- Reverse high byte and low byte data and then display.

Title Tab



Setting	Description		
Use title	Enable or disable title, which is marked as shown below:		
	No. Time Date Ch.0 5272 22:43:09 16/09/07 4 5271 22:43:08 16/09/07 2		
Title	Transparent		
background	When selected, hide the background for title area.		
	Color		
	Set the background color of title.		
Setting	Defines the text to be shown on the title.		
	Label Tag Library can be used for title in order to display the title in		
	multiple languages. Click [Setting] and select [Use label library].		







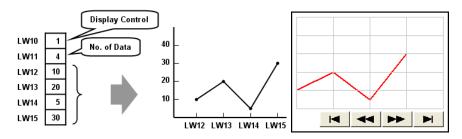
During off-line simulation, if the format of sampling data has been changed, please delete previous data records in C:\[EasyBuilder Pro directory]\HMI_memory\datalog to prevent the system from misinterpreting the old data records.



13.19. Data Block Display

13.19.1. Overview

Data Block is a combination of several word devices with continuous address, where the X axis of Data Block Display object represents the address and the numbers on the Y axis represent the data values in the corresponding address. Data Block Display object can display multiple data blocks. For example, it can display two data blocks LW-12~LW-15 and RW-12~RW-15 in trend curves simultaneously. It is very useful to observe and compare the difference of trend curves.



The display result

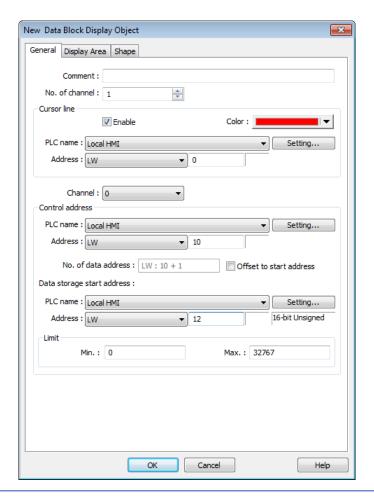
13.19.2. Configuration



Click the Data Block Display icon on the toolbar to open the property dialog box. Set up the properties, press OK button, and a new Data Block Display object will be created.



General Tab



Setting	Description	
Comment	Description of the object.	
No. of	Set the no of channel for this object. Each channel represents one	
channel	data block. The maximal number of channels is 12.	
Cursor Line	If enabled, when user touches the [Data Block Display] object, it will display a vertical cursor line on it, and store the data on the line to the designated registers. See Example 1.	
Channel	Select the channel to be configured.	
Control	Specify the control address also the data source.	
address	Control address is used to control and clear the drawn curve. After executing the operation below, the system will reset the control word to zero. Enter "0" = No action (default) Enter "1" = Draw (Without clear first) Enter "2" = Clear Enter "3" = Redraw	
	No. of data address If control address is LW-n, then LW-n+1 stores the number of word	
	in control address is Evv. if, then Evv. in 1 stores the number of word	



	devices in each data block, i.e. the number of data. The maximum
	value is 1024.
	Data storage start address
	If [Offset to start address] is enabled, the [Offset value storage
	address] will be set as [Control address] + 2.
	If select 16-bit data format, the address for each data will be start
	address, start address + 1, start address + 2 and so on.
	If select 32-bit data format, the address for each data will be start
	address, start address + 2, start address + 4 and so on.
	For more information about control address, see Example 2 to 5.
Limit	Set the minimum and maximum limit for the curve.



■ The system can draw at most N curves, where N = 32 divided by the number of channel.

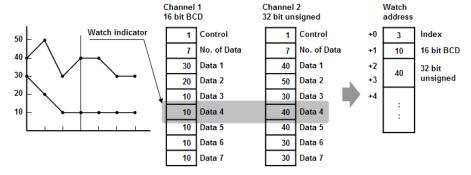
Example 1

How to use watch (Cursor Line) feature

Use "Watch" function to check the value of any point of the curve. When the user touches [Data Block] object, it will display a "cursor line", and the system will write the index and value of that data on the cursor line to the designated address.

Data Format	Index Value	Channel 1 Value	Channel 2 Value
16-bit	Address	Address + 1	Address + 2
32-bit	Address	Address + 2	Address + 4

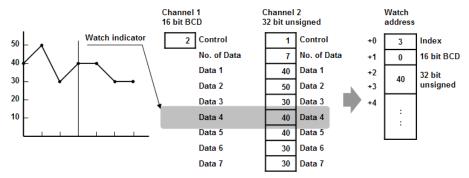
When watch address is set to LW-n, the value written into LW-n represents the channel index number to be called up. (Start form 0)



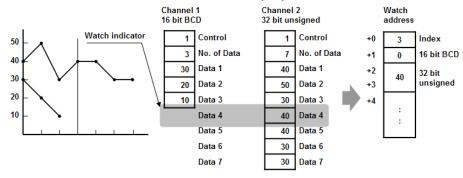


- [Data Index] is a 16 bit unsigned integer. When the designated register of cursor line is 32 bit device, it will be stored in the bit 0-15.
- If the channel to be viewed has no data, "0" will be displayed, as shown below. In the example, there is no data in channel 1, when the cursor points at Data 4, "0" will be displayed as shown below.





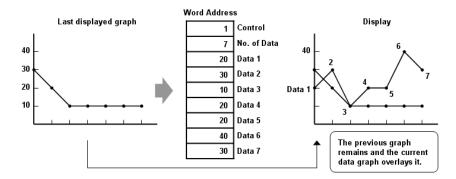
If there is less data in Channel 1, "0" will be displayed, as shown below.



Example 2

How to show a data block

- 1. Write the number of data to [No. of data address], i.e. "Control address+1"
- 2. Store the data consecutively beginning at [Data storage start address].
- **3.** Write "1" to [Control address] to draw the curve without cleaning the plot. All previous curves will not be erased.
- 4. The system will write "0" to [Control address] after marking the plot.





Do not change the content of [Control address], [No. of data address] and [Data storage start address] between step 3 and step 4 above as doing so might cause error for the trend curve plot.

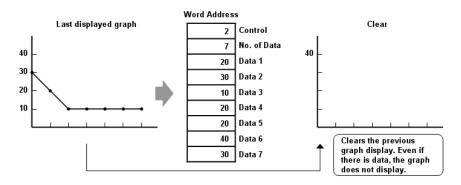


Example 3

How to clear the graph

1. Write "2" to [Control address], all the trend curves will be cleared.

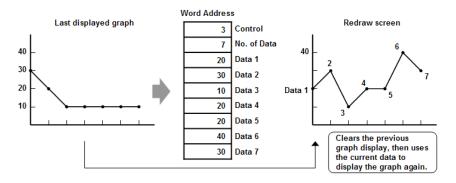
2. The system will write "0" to [Control address] after the trend curve is cleared.



Example 4

How to clear the previous trend curve and display new one

- 1. Write the number of data to [No. of data address], i.e. "control address+1"
- Store the data consecutively beginning at [Data storage start address].
- **3.** Write "3" to [Control address], the previous trend curves will be cleared and the new content in data block will be plotted on the screen.
- 4. The system will write "0" to [Control address] after the trend curve has been plotted.



Example 5

How to use offset mode

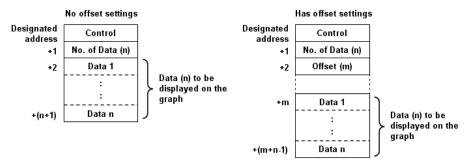
If [Offset to start address] is selected, [Control address], [No. of data address], and [Offset value storage address] will use 3 consecutive addresses.

For example, assume the total number of channels is 3 (start from 0 to 2), and the [Control address] are LW-0, LW-100, and LW-200, respectively. Then, the other addresses will be set as follows: (In the example, format 16-bit Unsigned is used and [Offset value storage address] are all m).



Item	Channel 0	Channel 1	Channel 2
Control Address	LW-0	LW-100	LW-200
No. of data	LW-1	LW-101	LW-201
address			
Offset value	LW-2 (=m)	LW-102 (=m)	LW-202 (=m)
storage address			
Data 1	LW-0+m	LW-100+m	LW-200+m
Data 2	LW-1+m	LW-101+m	LW-201+m

The following figure on the left shows the result when offset mode is not used while the figure on the right shows the result when offset mode is used.





When [Control address] is set to LW-n, [No. of data address] and [Offset value storage address] are as follows:

Data Type	16-bit	32-bit
Control address	LW-n	LW-n
No. of data address	LW-n+1	LW-n+2
Offset value storage address	LW-n+2	LW-n+4

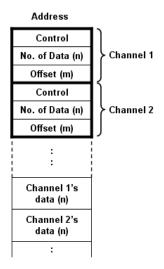
If the control registers are 32-bit devices, only bit 0-15 will be used for control purpose, bit 16-31 will be ignored. (as illustrated below)

	32 DI	i device
3	1 16	15 0
+0	0	Control
+1	0	No. of Data
+2	0	Offset

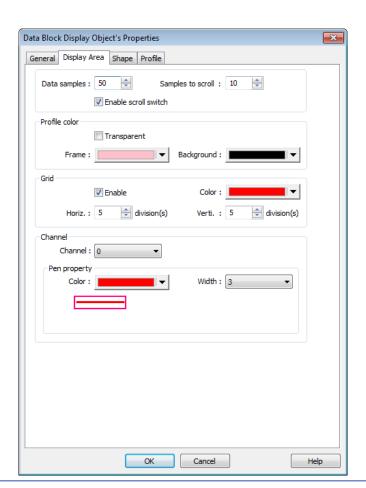
- When the value in [Control address] is not zero, the system will read [No. on data address] and [Offset value storage address].
- It is recommended to use [Offset to start address] for data block display with multiple channels and the same device type. As shown in the following figure, The control words of



channel 1 is located from LW-n, the control words of channel 2 is located from LW-n+3, and so on.



Display Area



Setting

Description

Description

Data samples

Configure the maximal number of data samples (points) to be displayed.



	Samples to scroll	
	Configure the number of data samples being scrolled.	
	Enable scroll switch	
	Clicking displays the previous or next data point.	
	Clicking displays the first or the last data point.	
Profile	Set the color of the frame and background of the object.	
	Transparent	
	Hides the background. Color selection will not be available.	
Grid	Set the number of horizontal and vertical divisions shown by grid.	
Channel	Set the color, width and style of each curve.	



13.20. XY Plot

13.20.1. Overview

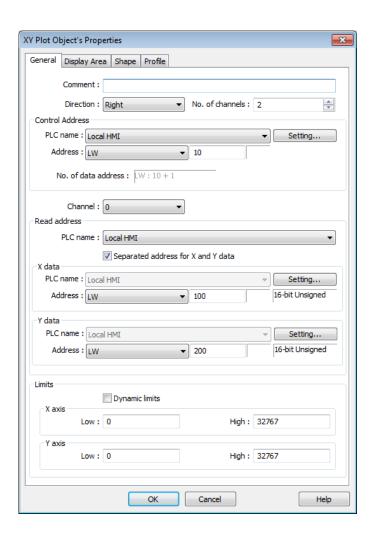
XY Plot object is used to display values for two variables (x,y) for a set of data, where the data comes from word registers. Up to 32 channels can be displayed simultaneously. This object facilitates data observation and analysis. Additionally, negative numbers can be displayed as well.

13.20.2. Configuration



Click the XY Plot icon on the toolbar to open a [XY Plot] object property dialog box.

General Tab





Setting	Description			
Direction	There are four selections, right, left, up or down.			
	Right Right direction The property of the pr	Left Left direction	Up Up direction × origin → Y	Down origin → Y X Down direction
No. of channels	Set the number	of channels for o	bservation.	
Control address	Controls the operation of all channels simultaneously. When the [Control address] is LW-n, assigning values to LW-n will issue commands to XY plot according to the table below. Meanwhile, LW-n+1 I controls the number of data points plotted. After		will issue Meanwhile,	
	operation, the [0	Control address] \	will be reset to 0.	
	Control Value	Result		
	LW-n 1		on XY curve. d points are kept.) Y curves.	
	3		plots new XY curv	re.
	LW-n+1 An	' (Ontrois th	e number of data _l	points plotted.
	No. of data address			
	Controls the number of data points. Each channel can plot up to 1023 points.			
Channel	Select a channel	to configure.		
Read Address	PLC name			
	Select a PLC which will be the source of [X data] and [Y data] and			
	designate a read address.			
	The format of the data register blocks used for the display channels			
	depends on whether [Separated address for X and Y data] and/or			
	[Dynamic limits] has been selected. See Example 1.			
Dynamic	• When not s	elected (See Exai	mple 2)	
limits	The Low and Hig	h limits can be se	et by entering cons	stants. The Low
	and High limits are used for calculating X and Y range in			
	percentage.			
	When selected (See Example 3)			
	A zoom effect can be created by changing the Low / High Limits.			

Example 1

The format of the data register blocks used for the display channels depends on whether [Separated address for X and Y data] has been selected, and if [Dynamic limits] has been selected. The following explains the situations where 16-bit register is used:

• If [Separated address for X and Y data] is **not** selected, and set [Read address] to LW-n:

	Select [Dynam	Select [Dynamic limits]		Dynamic limits]
	X data	Y data	X data	Y data
Low Limit	LW-n	LW-n+2	Constant	Constant
High Limit	LW-n+1	LW-n+3	Constant	Constant
1 st data	LW-n+4	LW-n+5	LW-n+0	LW-n+1
2 nd data	LW-n+6	LW-n+7	LW-n+2	LW-n+3
3 rd data	LW-n+8	LW-n+9	LW-n+4	LW-n+5
4 th data	LW-n+10	LW-n+11	LW-n+6	LW-n+7

 If [Separated address for X and Y data] is selected, and set [X data] to LW-m, [Y data] to LW-n:

	Select [Dynami	Select [Dynamic limits]		ynamic limits]
	X data Y data		X data	Y data
Low Limit	LW-m+0	LW-n+0	Constant	Constant
High Limit	LW-m+1	LW-n+1	Constant	Constant
1 st data	LW-m+2	LW-n+2	LW-m+0	LW-n+0
2 nd data	LW-m+3	LW-n+3	LW-m+1	LW-n+1
3 rd data	LW-m+4	LW-n+4	LW-m+2	LW-n+2
4 th data	LW-m+5	LW-n+5	LW-m+3	LW-n+3

Example 2

When [Dynamic limits] is not selected, the Low and High limits can be set. The Low and High limits are used for calculating X and Y range in percentage.

$$Scale (\%) = \frac{Read Address Value - Low Limit}{High Limit - Low Lmit}$$

If [Separated address for X and Y data] is **not** selected and the address is LW-n, the corresponding limits are retrieved from the addresses as shown in the following table.

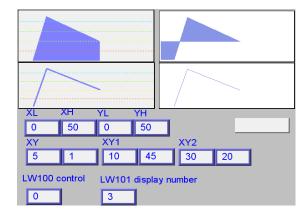
Data format	16-bit	32-bit
X axis low limit	LW-n	LW-n
X axis high limit	LW-n+1	LW-n+2
Y axis low limit	LW-n+2	LW-n+4
Y axis high limit	LW-n+3	LW-n+6



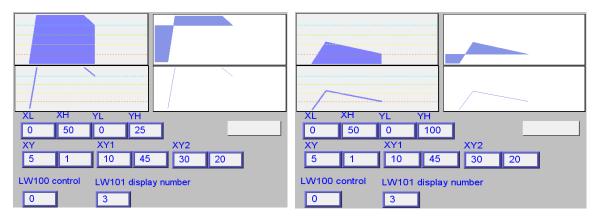
Example 3

If **[Dynamic limits]** is selected, a zoom effect can be created by changing the setting of Low / High Limits.

In the following example, XL=X low limit, XH=X high limit, YL=Y low limit, YH=Y high limit, and XY, XY1, XY2 are three XY data. When changing the high limits of X and Y axis, the result is shown below:

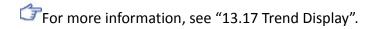


Original



Change the high limit of Y axis to 25. (zoom in)

Change the high limit of Y axis to 100 (zoom out)

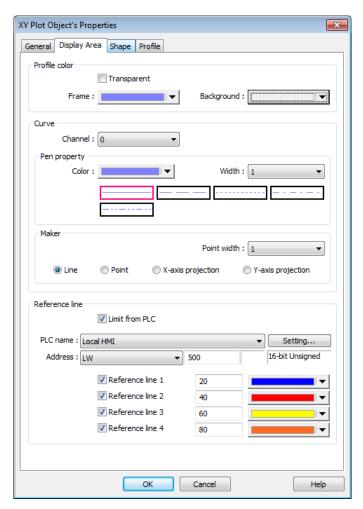




- For cMT Series, on the screen of the visualization device directly pinch two fingers together to zoom out or spread them apart to zoom in.
- X and Y data can be set to different formats. For example: If X data uses 16-bit unsigned, Y data uses 32-bit signed, please note the address setting.
- When using a Tag PLC, such as AB tag PLC, X and Y must be in the same format. When using different formats a warning will be shown.



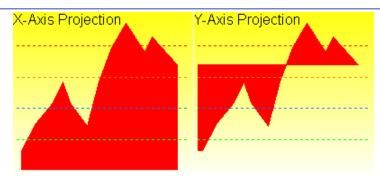
Display Area Tab



Setting	Description		
Profile color	Select the color of the frame and the background, or select		
	[Transparent] check box to hide the frame and background.		
Curve	For each channel select the properties of color, width, and line		
	style.		
Maker	There are four different types of XY plot. The result is shown below:		
	Line Dot		







See Example 4.

Reference line

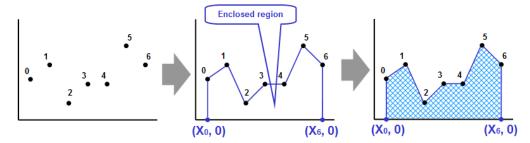
Up to 4 horizontal reference lines can be shown on the graph. Fill in high, low limits and Y axis percentage values. Different colors can be selected for each reference line.

If [Limit from PLC] is selected, designate a register to be the read address of reference line.

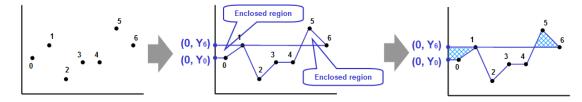
Example 4

The curve shown in the following figure is drawn with 7 points numbered from P0 to P6. The steps the system draws the X-axis Projection are:

- 1. Calculates the two points in X-axis $(X_0, 0)$ and $(X_6, 0)$.
- 2. Link all the points in the order of $(X_0, 0)$, P0... P6, $(X_6, 0)$ and returns to $(X_0, 0)$ at last.
- 3. Fill out all enclosed areas.



Similarly for Y-axis projection:





- XY Plot can be drawn repeatedly up to 32 times:
 - 1 channel → 32 times
 - 2 channels → 16 times

The way to calculate: 32 divided by the number of channels.



13.21. Alarm Bar and Alarm Display

13.21.1. Overview

Alarm Bar and Alarm Display objects are used to display alarm messages which are defined in Event (Alarm) Log objects. When the trigger conditions are met, events or alarms will be displayed as they occur in chronological order in Alarm Bar or Alarm Display object.

Alarm Bar scrolls all alarm messages in one single display line, whereas Alarm Display shows alarm messages in multiple lines.

For more information, see "7 Event Log".

```
1 (When LW 1 >= 10) 13:21:06 Event 0 (when LW0
```

Alarm Bar - Displays alarm messages in one scrolling line.

Alarm Display – Displays alarm messages in multiple lines.

13.21.2. Configuration



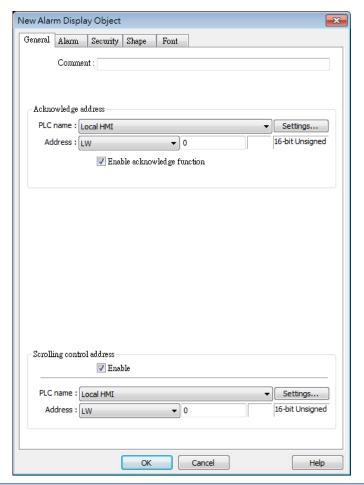


Click the Alarm Display or Alarm Bar icon on the toolbar to open the object property dialog box. Set up the properties, press OK button, and a new object will be created.

General Tab

The difference between these two objects is that Alarm Display allows an [Acknowledge address] and a [Scrolling control address] to be set.





Setting **Description Enable** If selected, the [Acknowledge value] selected for the associated event, specified in Alarm (Event) Log » Message tab will be written to acknowledge function the [Acknowledge address] designated in Alarm Display. For more information, see "7 Event Log". Acknowledge value for Event/Alarm Display object Acknowledge value: 11 Scrolling If enabled, the value in the designated control address indicates the control number of lines to be scrolled down. The minimal value is 0, which address indicates the first line.

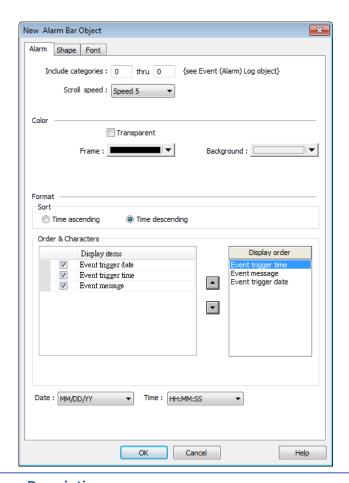


■ When using cMT-SVR, press and hold the event on the screen to acknowledge an event; drag a finger on the screen to scroll.

The following are general settings of these two objects:



Alarm Tab



Setting	Description
Include	Events in the selected category will be displayed. The categories are
categories	set in Event (Alarm) Log object.
	For example, if the category is set to "2 to 4" here, only events in
	categories 2, 3, 4 will be displayed. For more information, see "7
	Event Log".
Scroll speed	This selection is only available for Alarm Bar. Select one of the
	speed settings at which the messages scroll.
Format	Time ascending
	Latest alarm is placed last in the list (the bottom).
	Time descending
	Latest alarm is placed first in the list (the top).
	Display order
	Select the items to be displayed and use the up and down arrow
	buttons to adjust the display order of the alarms.
	Date
	Displays the date tag with each alarm message. The four formats of
	date tag:
	MM/DD/YY、DD/MM/YY、DD/MM/YY、YY/MM/DD



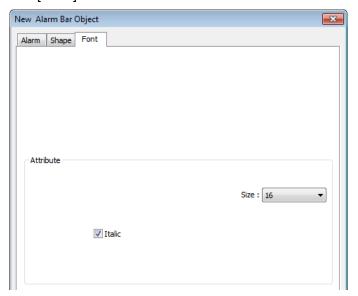
Time

Displays the time tag with each alarm message. The four formats of time tag:

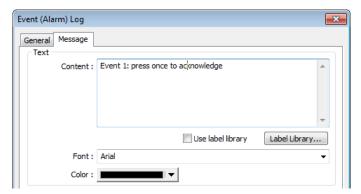
 $\mathsf{HH:MM:SS} \cdot \mathsf{HH:MM} \cdot \mathsf{DD:HH:MM} \cdot \mathsf{HH}$

Font Tab

Set the font size or select [Italic].



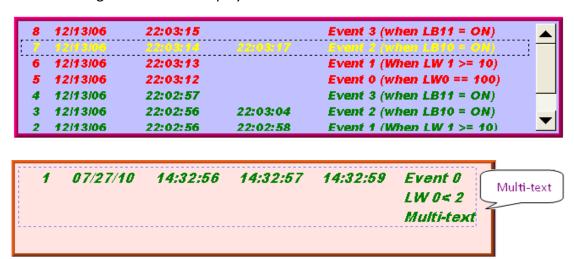
The font, color, and content of the alarm messages displayed in Alarm Bar and Alarm Display objects are set in Alarm (Event) Log object:



13.22. Event Display

13.22.1. Overview

Event Display object is used to display event messages which are defined in Event (Alarm) Log and have met a trigger condition. The triggered events are displayed in the chronological order. Event Display object displays not only the date and time the event occurs, but also the time the event is acknowledged, the time the event returns to normal, and the event message. Multi-lined messages can also be displayed.



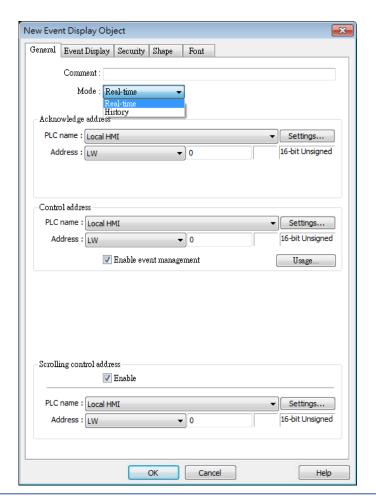
13.22.2. Configuration



Click the Event Display icon on the toolbar to open an Event Display object property dialog box. Set up the properties, press OK button, and a new Event Display object will be created.

General Tab

13.22.2.1. **eMT, iE, XE, mTV Series**



Setting

Description

Mode

The available modes are: [Real-time] and [History].

- Real-time
- History

The system reads the event log in HMI memory and displays them. The content can be updated by changing window. In case when the trend display shows history data from today, the display will refresh once per second.

All the events triggered since HMI starts up are displayed.

Acknowledge address

When in Real-time mode, and an event is acknowledged by touching an active display line, the [Acknowledge value] specified in Event (Alarm) Log object, Message tab, is output to the [Acknowledge address] of Event Display object. For more information, see "7 Event Log".



Acknowledge value: 11

History Control

When in History mode, and if:

[Enable reading multiple histories] is not selected

Daily event log files can be displayed. A history control address can be designated. The value in the designated register is used as an index to select historical files.

Index value 0 displays the latest file.

Index value 1 displays the second latest file.

Index value 2 displays the third latest file, and so on.

If control address to LW-100, and four data log exist with dates:

EL_20100720.evt, EL_20100723.evt, EL_20100727.evt, and EL_20100803.evt.

Each index value in the control word corresponds to a record according to the table below:

Value in LW-100	The corresponding record
0	EL_20100803.evt
1	EL_20100727.evt
2	EL_20100723.evt
3	EL_20100720.evt

[Enable reading multiple histories] is selected

Displays a list of events triggered in multiple days. If [History control] address is set to LW-n, the LW-n to LW-n+1 form a range of log selection.

Number of days

The data range starts from the number in LW-n. The value in LW-n+1 represents how many days to be included from the start to days before.

Example: As illustrated below, if LW-n = 1, and LW-n+1 = 3, then the range of data will start from 20100609, and include the data of 2 days before (20100609 included). However, since the data of 20100607 does not exist in this example, the data displayed will only include 20100609 and 20100608.

👺 EL_20100604	No.4	1 KB	EVT
EL_20100605	No.3	6 KB	EVT
EL_20100608	No.2	17 KB	EVT
EL_20100609	No.1	4 KB	EVT
SEL 20100610	No.0	12 KB	EVT

Index of the last history

The range of data will start from the number in LW-n and end in LW-n+1. If LW-n = 1, and LW-n+1 = 3, the data displayed will include data No.1, No.2, No.3. If the number entered in LW-n+1 is greater than the number of event log files, LW-n+1 will not be effective and only the data specified by LW-n is displayed.



👺 EL_20100604	No.4	1 KB	EVT
EL_20100605	No.3	6 KB	EVT
SEL_20100608	No.2	17 KB	EVT
SEL_20100609	No.1	4 KB	EVT
EL 20100610	No.0	12 KB	EVT

The maximum size of data that can be displayed is 4MB; the exceeding part will be ignored.

The following shows how data will be stored when the data size is too big.

5 history data, each 0.5MB → Data displayed: 8 x 0.5MB

5 history data, each 1MB → Data displayed: 4 x 1MB

5 history data, each 1.5MB → Data displayed:

2 x 1.5MB+1 x 1MB (partial)

Control address

Enable event management

If this check box is selected, writing a specific value into register LW-n and LW-n+1, where n is an arbitrary number, will control [Event Display] object with different commands as shown below:

1 /4 /				
Address	Value	Command		
LW-n	0	Display all events.		
	1	Hide [Confirmed] events.		
	2	Hide [Recovered] events.		
	3	Hide [Confirmed] or [Recovered] events.		
	4	Hide [Confirmed] and [Recovered] events.		
LW-n+1	1	Delete a single selected event.		

Scrolling control address

If enabled, the value in the designated control address indicates the number of lines to be scrolled down. The minimal value is 0, which indicates the first line.

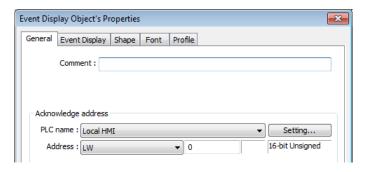
In the following figure, there are 10 events recorded in the object, and value 3 is set at the control address. The upper event object displays the events in time ascending order, and begins at the 4th event; on the other hand, the lower one displays the events in time descending order, and begins at the 7th event.

	4	18:48:19	Test Event	ī
	5	18:48:19	Test Event	ı
event LB0	6	18:48:20	Test Event	ı
	7	18:48:20	Test Event	ı
	8	18:48:20	Test Event	
Scrolling ! Control				
	7	18:48:20	Test Event	
0003	6	18:48:20	Test Event	ı
	5	18:48:19	Test Event	1
	4	18:48:19	Test Event	ı
	3	18:48:19	Test Event	

If [Scrolling control address] is enabled, the scroll bar cannot be used for scrolling, but still shows the relative position of the content. If the control address holds a value that is larger than the total number of lines, the display will stroll to the end.

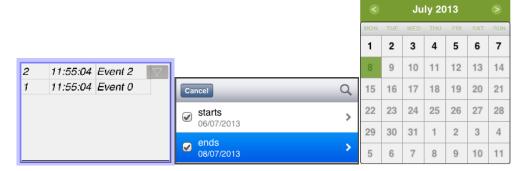


13.22.2.2. **cMT-SVR Series**



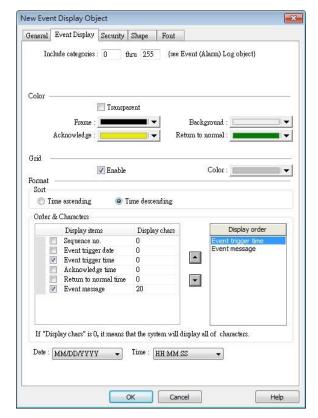
For cMT-SVR, all the events occur are displayed and updated in real-time.

Press the filter icon in the upper-right corner of the object and set the start and end date. If the dates are not set, all the events are displayed.

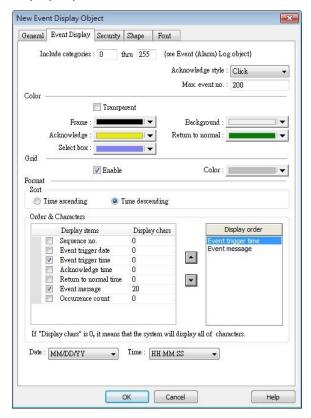


Event Display Tab

cMT Series



eMT, iE, XE, mTV Series





Setting	Description		
Include	Events in the selected category will be displayed. The categories are		
categories	set in Event (Alarm) Log object.		
	For example, if the category is set to 2 to 4 here, only events in		
	categories 2, 3, 4 will be displayed. For more information, see "7		
	Event Log".		
Acknowledge	Select [Click] or [Double Click] to acknowledge each single event.		
style	When an event occurs the user can tap the event line once or twice		
	to acknowledge the new event.		
	When acknowledged, the text color of the event will change to the		
	selected color, and the acknowledge value associated with that		
	event will be sent to the register designated in [Acknowledge		
	address]. If the address is set to LW-100, and the acknowledge		
	value is set to 31, when user acknowledges the event, value 31 is		
	written to LW-100.		
	This can be used in conjunction with Indirect Window object so		
	that when an event is acknowledged, the corresponding message		
	window is displayed.		
Max. event	The maximum number of events to be displayed in this Event		
no.	Display object. When the number of the displayed events equals to		
	the set maximum number, the new coming event will overwrite the		
	latest event.		
Color	Different colors indicate different event states, such as		
	acknowledged, returns to normal, or selected. The system draws a		
	highlight box around the latest selected event.		
	Acknowledge		
	6 13:12:19		
	4 #3/#2/#5 #24/#2/25 Event 2 (when LB10 = ON)		
	2 13:12:14		
	Sequence no. Return to normal Select box		
Grid	Displays a grid of rows and columns in the object. The color of the		
	grid lines can be selected.		
Format	trigger date trigger time notification time return to normal time		
	0 12/14/06 15:26:21 15:26:31 15:26:36 Event 0 (when LV		
	2 12/14/06 15:26:48 Event 2 (when LE		
	Time ascending		
	Time ascending Latest event is placed last in the list (the bettem)		
	Latest event is placed last in the list (the bottom).		
	Time descending		
	Latest event is placed first in the list (the top).		



Order & Characters

Select the items to be displayed and use the up and down arrow buttons to adjust the display order of the events.

Date

Displays the date tag with each event message. The four formats of date tag:

MM/DD/YY · DD/MM/YY · DD/MM/YY · YY/MM/DD

Time

Displays the time tag with each event message. The four formats of time tag:

HH:MM:SS、HH:MM、DD:HH:MM、HH

Font Tab

In Real-time mode: Users may select Italic font and set the font size. The font is displayed according to the setting in Event Log object.

In History mode: Users may select Italic font and set the font size, font and color, or tick the [Font from label library] check box.





13.23. Data Transfer (Trigger-based)

13.23.1. Overview

Data Transfer (Trigger-based) object can transfer values from the source register to the destination register. The data transfer operation can be activated by changing the state of the designated bit register, or by manually pressing the object.

For cMT Series, only touch trigger mode is available.

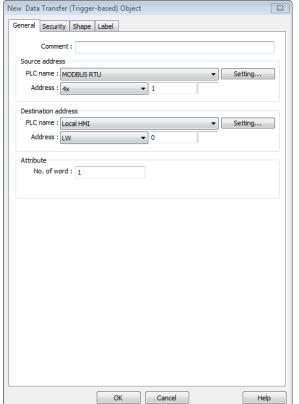
13.23.2. Configuration



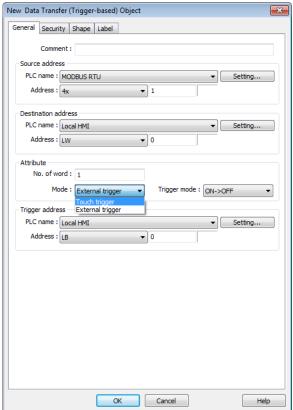
Click the Data Transfer (Trigger-based) icon on the toolbar to open the property dialog box. Set up the properties, press OK button, and a new Data Transfer (Trigger-based) object will be created.

General Tab

cMT Series



eMT, iE, XE, mTV Series





Setting	Description		
Source address	Data Transfer object reads the data from [Source Address].		
Destination address	Data Transfer object writes the data to [Destination Address].		
Attribute	No. of words		
	The number of words to be transferred from [Source Address] to		
	[Destination Address]. The unit is word.		
	Mode		
	Touch trigger		
	Press the object to activate data transfer operation.		
	External trigger		
	The data transfer operation is activated when the state of the		
	designated bit address changes.		
	There is a further selection to make of whether the data transfer		
	operation is activated after Off to ON, ON to OFF transition, or at		
	both of the changes of state.		
Trigger address	Specify a bit address for [External trigger] mode.		



■ When using Data Transfer Trigger Based object, place the control bit addresses in the same window in order to trigger Data Transfer. If the Data Transfer Trigger Based object is placed in the common window, when the state of the control bit addresses placed in any window changes, Data Transfer is triggered.



13.24. Backup

13.24.1. Overview

Backup object can transmit recipe data (RW, RW_A), event log, recipe database, sampling data, and operation log to an external device (SD card, USB disk), in a specified time range or format. For example, when the event log is saved in a SD card, a USB disk can be inserted when HMI power is still ON, and use Backup object to copy the data into USB disk from SD card, and then remove USB disk without turning off HMI power. The data saved in USB disk can be used on PC for analyzing. When the system is backing up, the state of system register [LB-9039] is set ON. With [e-Mail] option, information can be sent to configured email contacts.

13.24.2. Configuration



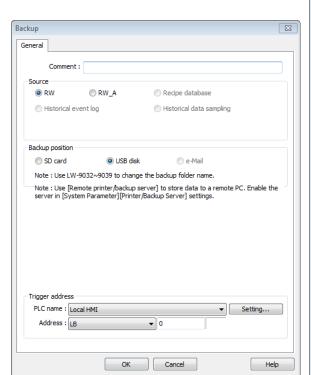
For eMT, iE, XE, mTV Series, click Backup icon on the toolbar to open a [Backup] object property dialog box. Set up the properties, press OK button, and a new Backup object will be created.

For cMT Series, click Backup icon on the toolbar to open a [Backup] object managing dialog box, click [New] to open a [Backup] object property dialog box. Set up the properties, press OK button, and a new Backup object will be created.

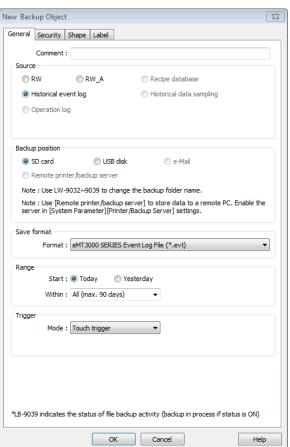


General Tab

cMT Series



eMT, iE, XE, mTV Series



Setting

Source

[RW], [RW_A], [Recipe database], [Historical event log], [Historical data sampling], [Operation log]

Select one from the above for the source. When backing up [Historical data log], use [Data Sampling object index] to select the one to back up.

Backup position

Select the destination where the source files will be saved to.

SD card / USB disk

Description

The external device connected to HMI.

If using cMT series, SD card and USB disk can only save [RW], [RW A], and [Recipe database].

Remote printer/backup server (eMT, iE, XE, mTV Series)

To select this, enable MT remote printer/backup server at: [Menu]

» [Edit] » [System Parameters] » [Printer/Backup Server].

Please note that [Operation log] backup can only be saved to

Remote printer/backup server. To save into a SD card or USB drive,



please use the control address of Operation Log object.



For more information, see "26 EasyPrinter".

E-mail

To use e-mail, go to [System Parameters] » [e-Mail] tab to configure first. And then go to Backup object » [e-Mail] tab to configure the recipient address, subject, and message.

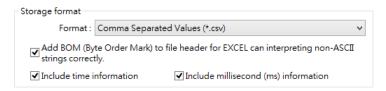
Save format

Select the desired format to back up the file.

eMT, iE, XE, mTV Series:

- HMI Event Log File (.evt) / HMI Data Log File (.dtl)
- Comma Separated Values (.csv)

When back up event log in .csv format, open the csv file in EXCEL. The BOM (Byte Order Mark) can be added to the file header so that the .csv file containg non-ASCII strings can directly be opened in EXCEL. The time information can be included or omitted in the backed-up .csv file.



The [Event] column is included in the backup file to indicate the type of the event.

	Α	В	С	D	Е
1	Event	Category	Date	Time	Message
2	0	1	2013/7/4	16:12:11	Event A
3	2	1	2013/7/4	16:12:12	Event A
4	0	0	2013/7/4	16:12:33	Event B
5	2	0	2013/7/4	16:12:36	Event B
6	0	0	2013/7/4	16:12:37	Event B
7	1	0	2013/7/4	16:12:37	Event B
8	2	0	2013/7/4	16:12:39	Event B
9	0	0	2013/7/4	16:12:40	Event B

0 = Event is triggered

1 = Event is acknowledged

2 = Event returns to normal

EasyConverter can be used to easily convert HMI Event Log File (.evt) and HMI Data Log File (.dtl) to .xls or .csv format.

SQLite Database File (.db)

cMT Series:

- SQLite Database File (.db)
- Comma Separated Values (.csv)

Range

Within

Select the number of days. For example, [Yesterday] is selected at [Start], and [2 day(s)] is selected here, which means the files



obtained yesterday and the day before yesterday will be backed up.
Select [All] to save all files in the system, the maximum is 90 days.

Trigger

Mode

(eMT, iE, XE, mTV Series)

There are three ways to activate Backup function.

Touch trigger

Touch the Backup object to activate backup operation.

External trigger (bit)

Register a bit device to trigger the backup operation.

Select whether the backup operation is activated after Off to ON,

ON to OFF transition, or at both of the changes of state.

External trigger (word)

Users can specify the number of days to backup data using [Trigger address]. [Trigger address] usage (suppose LW-n is used):

LW-n: Will start to back up when the value changes from 0 to 1.

LW-n+1: The start date of backup.

LW-n+2: The number of days for backup. (The maximum: 90 days).



Trigger address (cMT Series)

When the state of the designated register is set ON, the backup operation is activated. When the backup operation is done, the state of the designated register is set OFF.

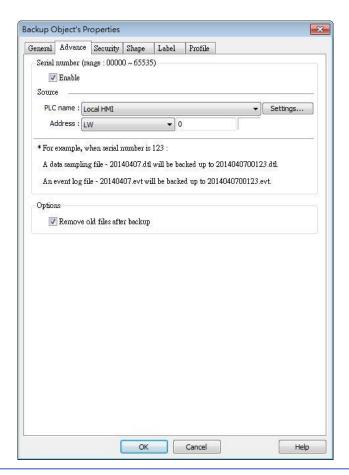


- All history files should have been saved in memory, either HMI memory, USB disk or SD card. Otherwise, the Backup object will not work.
- The maximum number of days for backup is 90 days. (Not including cMT Series)

For cMT Series, see "7 Event Log" and "8 Data Sampling" that explain the mechanism of synchronizing data to external device.



Advance Tab



Setting	Description
Serial number	If enabled, when backing up history files, a user-defined, 5-digit
	serial number can be appended to the end of the file name of the
	history data backup.
	The serial number is determined by the value in the designated
	source address. After backup, the value of this LW address will
	automatically increment by 1.
	The range of the serial number is 0~65535
	For example, if the serial number is 123, the appended 5 digits will
	be 00123.
	A data sampling file -20140407.dtl will be backed up as
	2014040700123.dtl.
	An event log file -20140407.evt will be backed up as
	2014040700123.evt.
Options	Remove old files after backup
	If selected, the old history files will be removed after backup.



cMT Series does not support Advance settings.



e-Mail Tab



Setting	Description
Add .txt	
extension to	If selected, when sending backup data as an email attachment, the
the filename	filename extension .txt will be added to the file name. This
to skip the	prevents the mail server or anti-virus software from blocking
anti-virus	emails.
detection	
Recipients,	
Subject,	Back up the email address of the recipients, the subject of the
Message	email, and the message content.



13.25. Media Player

13.25.1. Overview

At the first time using Media Player object in the project, download the project to HMI via Ethernet. EasyBuilder Pro installs Media Player driver automatically.

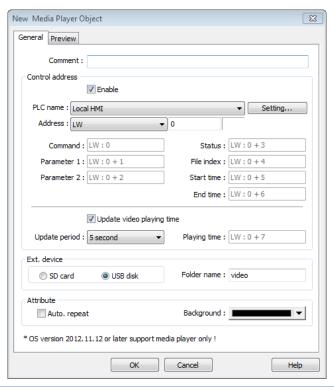
Media Player object plays video files with controls such as seek, zoom, and volume adjustment to provide maintenance instructions or procedures on video so as to enable on-site operators to perform tasks efficiently.

13.25.2. Configuration



Click the Media Player icon on the toolbar to open a Media Player object property dialog box. Set up the properties, press OK button, and a new Media Player object will be created.

General Tab







address

Designate a word register to control the object operations.

Not selected

No manual control. Video will be played automatically when the designated window opens.

Command (control address + 0)

Enter a value in the Command register to designate which action is executed.

Parameter 1 (control address + 1)

Enter a value in Parameter 1 associated with each command action.

Parameter 2 (control address + 2)

Enter a value in Parameter 2 associated with each command action.

Status (control address + 3)

Indicates the status or errors.

File index (control address + 4)

The file number in the designated folder. It is recommended to file the video name with a number.

Start time (control address + 5)

The start time of the video (second). 0, normally.

End time (control address + 6)

The end time of the video (second). (The time length of the video)

Update video playing time

If enabled, the elapsed playing time of video will be written into [Playing time] register at a rate set by [Update period] in seconds.

Update period

Update period of [Playing time], range from 1 to 60 (second).

Playing time (control address + 7)

The elapsed playing time of video (Second). Normally between start time and end time.

Ext. device

Play video files in SD card / USB disk.

Folder name

The folder name of video files stored in SD card or USB disk. Files must be stored in root directory. Subdirectories won't be accepted.

(For example, "example\ex" is an invalid directory.)

[Folder name] cannot be empty, must be alpha-numeric, and all in ASCII character.

Attribute

Auto. repeat

When finish playing all the video files, replay from the first file.

Ex: Video 1 > Video 2 > Video 1 > Video 2

Background

The background color of the object.





The data format for control address is 16-bit Unsigned or 16-bit Signed. If using 32-bit Unsigned or 32-bit Signed, only the previous 16 bits will be effective.

Control command

The following are the settings of different commands.

Play index file

```
[Command] = 1

[Parameter 1] = file index

[Parameter 2] = ignore (set 0)
```



- Files are stored with file names in ascending order.
- If the file cannot be found, [Status] bit 8 is set ON.
- Please stop the playing video before switching to another.

Play previous file

```
[Command] = 2
[Parameter 1] = ignore (set 0)
[Parameter 2] = ignore (set 0)
```



- If [File index] is zero, the same file is replayed.
- If the file cannot be found, [Status] bit 8 is set ON.

Play next file

```
[Command] = 3

[Parameter 1] = ignore (set 0)

[Parameter 2] = ignore (set 0)
```

- If there are no more files, the index 0 file is played.
- If the file cannot be found, [Status] bit 8 is set ON.

Pause / Play Switch

```
[Command] = 4

[Parameter 1] = ignore (set 0)

[Parameter 2] = ignore (set 0)
```

Stop playing and close file

```
[Command] = 5
[Parameter 1] = ignore (set 0)
```



[Parameter 2] = ignore (set 0)

Start playing from the designated time

```
[Command] = 6
[Parameter 1] = target time (second)
[Parameter 2] = ignore (set 0)
```



Parameter 1 (target time) must be less than the ending of time or it plays the last second.

Forward

```
[Command] = 7
[Parameter 1] = target time (second)
[Parameter 2] = ignore (set 0)
```



- Going forward to the designated second in [Parameter 1]. If the video is paused, the forwarding action will be started by playing.
- When the designed time is later than the end time, it plays the last second.

Backward

```
[Command] = 8
[Parameter 1] = target time (second)
[Parameter 2] = ignore (set 0)
```



- Going Backward to the designated second in [Parameter 1], if the video is paused, the backward action will be started by playing.
- When the designed time is earlier than the beginning time, it plays from beginning.

Adjust volume

```
[Command] = 9

[Parameter 1] = volume (0 \sim 128)

[Parameter 2] = ignore (set 0)
```



Default volume is 128.



Set video display size

[Command] = 10 [Parameter 1] = display size (0 ~ 16) [Parameter 2] = ignore (set 0)



- [Parameter 1 = 0] : Fit video image to object size.
- Parameter $1 = 1 \sim 16$]: Magnification from 25% $\sim 400\%$ in 25% increments where 1 = 25%, 2 = 50%, 3 = 75% and so on.

Status (control address + 3)

When playing a video the system sets [File Open (bit00)] and [File Playing (bit01)] to ON. If the file cannot be found, or an invalid command is entered, the Command Error bit 08 is set ON. If the file format is not supported, or a disk I/O error occurs, during playback (for example, USB disk unplugged), the File Error bit 09 is set ON.

15	09	08	02 01	00	bit
Reserved (all 0)	0	0	0	0	

00: File Opened / Closed (0 = closed, 1 = opened)

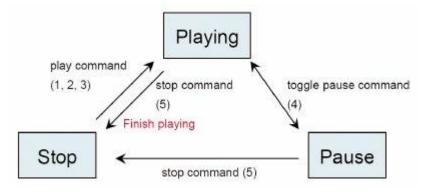
01: File Playing (0 = not playing, 1 = playing)

08: Command Error (0 = accepted, 1 = incorrect)

09: File Error (0 = accepted, 1 = incorrect)



■ The figure shows the status value associated with each state:



[Command], [Parameter 1], and [Parameter 2] are write addresses. All others are read only.



Preview Tab

Users can test whether the video format is supported by using the preview function.



Setting	Description		
Forward << /	Co forward or bookward of the video (in minutes)		
Backward >>	Go forward or backward of the video. (in minutes)		
Play / Pause	Select to start playing video or pausing.		
Stop	Stop playing and close the video file. To test another video, please		
	stop playing the current video first.		
Load	Select a video to preview.		



- Only one video file can be played at one time.
- If [control address] is not enabled and [Auto. repeat] is not selected, after finish playing the first file, the system will stop playing and close the video file.
- If [control address] is not enabled, the system will find the first file in the designated folder and start to play (in ascending order of the file name).
- If the file can be previewed, the format is supported. If the video image quality is poor, please adjust the resolution.
- The supported formats: mpeg4, xvid, flv...etc.

Click the icon to download the demo project. Please confirm your internet connection before downloading the demo project.



13.26. Data Transfer

13.26.1. Overview

Data Transfer object is similar to Trigger-based Data Transfer object. They transfer the data from source to destination register. The difference is that Data Transfer object transfers data based on time schedule, and is able to transfer data in bits.

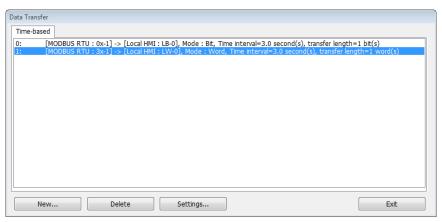
When using cMT Series, Data Transfer object is divided into two modes: [Time-based] and [Bit trigger]. In these two modes, the system automatically detects the state of the designated bit register and executes data transfer. [Time-based] mode is the same as described earlier, where [Bit trigger] mode transfers data when the state of the designated bit register changes. For the detail of [Bit trigger] mode, see "13.26.2.2 Data Transfer Bit Trigger".

13.26.2. Configuration

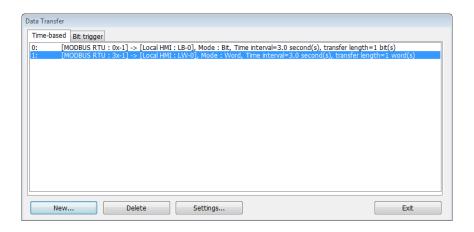


Click Data Transfer icon on the toolbar to open the Data Transfer management dialog box. Click [New] and configure the properties. All the defined Data Transfer can be viewed from the dialog box as shown in the following figure.

eMT, iE, XE, mTV Series



cMT Series

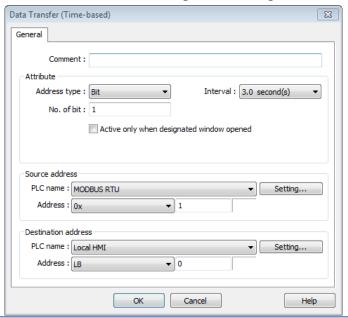




13.26.2.1. Data Transfer Time-based

General Tab

Click the [New] button in the Data Transfer management dialog box.



Setting

Description

Attribute

Address type

Select the data type, either [Bit] or [Word].

smaller amount of data to transfer.

No. of bits /No. of words

When [Bit] is selected in [Address type], set the number of bits transferred each time when data transfer is triggered.

When [Word] is selected in [Address type], set the number of words transferred each time when data transfer is triggered.

Interval

Select the time interval of data transfer, for example, when 3 seconds is set, the system will transfer data every 3 seconds. Specifying a short time interval or a big number of data to transfer may cause an overall performance of system decrease. Therefore, it is recommended that users choose a longer time interval and a

When a short interval is inevitable, be aware of the interval must be longer than the data transfer operation. For example, if the data transfer operation takes 2 seconds, set the interval longer than 2 seconds.

Source address

Data Transfer object reads the data from [Source Address].

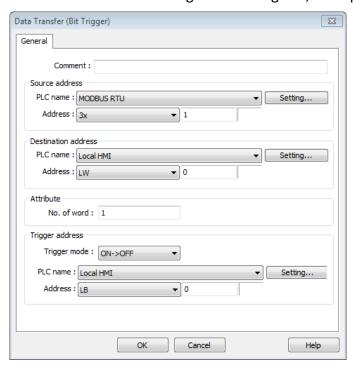


Destination	Data Transfer object writes the data to [Destination Address].
address	Data transfer object writes the data to [Destination Address].

13.26.2.2. Data Transfer Bit Trigger

General Tab

Click the [New] button in the Data Transfer management dialog box, and open [Bit trigger] tab.



Setting	Description
Source address	Data Transfer object reads the data from [Source Address].
Destination address	Data Transfer object writes the data to [Destination Address].
No. of word	Set the number of words transferred each time when data transfer
	is triggered.
Trigger	Set the register that controls data transfer and select the trigger
address	mode.
	Trigger mode
	Trigger data transfer when the state of the designated register
	changes from Off to ON, ON to OFF, or at both of the changes of
	state.



13.27. PLC Control

13.27.1. Overview

PLC Control object can execute commands when it is triggered.

13.27.2. Configuration



Click the PLC Control icon on the toolbar to open the PLC Control Object management dialog box. To add a PLC Control object, click [New], set up the properties, press OK button and a new PLC Control object will be created.

```
PLC Control Object

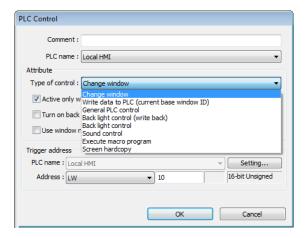
1: [Local HMI: LB-8999] => Sound control: OFF->ON, PLC no response (67 k)
2: [Local HMI: LW-100] => Change window (clear data after window changed)
3: [Local HMI: LW-110] => Beneral PLC control
5: [Local HMI: LW-120] => Change window (clear data after window changed)
6: [Local HMI: LW-120] => Execute macro program: [ID:000] macro_0 (OFF->ON) (active on Window 4)

New...

Delete Settings...

Exit
```

Click [New] and the following dialog box appears. See "13.27.2.1 Type of Control".



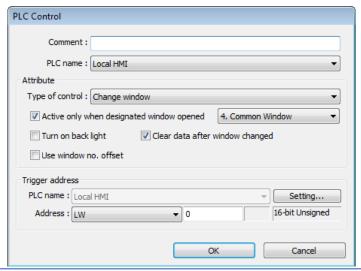


■ The [PLC Control] and [Backlight Control] options are not available for cMT Series.



13.27.2.1. Type of Control

Change window



Setting	Description
Active only when	
designated	Allow this operation only if a particular screen is displayed.
window opened	
Turn on back light	The backlight is turned ON when the window object is
	changed. (Not available for cMT Series)
Clear data after	Reset the value at trigger address to zero when the window
window changed	object is changed.
Use window no.	Select the check box and select a window offset, the new
offset	window no. to change to will be the value in [Trigger address]
	plus the offset. For example, if [Trigger address] is LW-0 and
	offset is set to -10. When the value in LW-0 is 25, the system
	will change to window no. 15 (25-10=15). The range of the
	offset is -1024 to 1024. The [Clear data after window changed]
	check box is not available if [Use window no. offset] is selected.



If [LB-9017] is set ON, the write-back function will be disabled, the new window number is not written back into a designated address.

Place a valid window number in the designated trigger address to change the base screen to the new window number. The new window number is written back into the designated address.

For example, if current window is window no. 10, and [Trigger address] is set to LW-0, When LW-0 is changed to 11, the system will change the current window to window no. 11,



and then write 11 to LW-1.

When the window is changed, the new window number is written back into the address that is calculated by [Trigger address] and the data format, as shown in following table.

Data Format	Trigger address	Write address
16-bit BCD	Address	Address + 1
32-bit BCD	Address	Address + 2
16-bit Unsigned	Address	Address + 1
16-bit Signed	Address	Address + 1
32-bit Unsigned	Address	Address + 2
32-bit Signed	Address	Address + 2

Write data to PLC (current base window)

Each time the base window is changed, the new window number will be written into the [Trigger address].

General PLC Control (eMT, iE, XE, mTV)

Transfer word data blocks from PLC to HMI, and vise-versa, and the transfer direction is controlled by the value in the [Trigger address].

Value in	Action
[Trigger address]	
1	Transfer data from PLC register → HMI RW register
2	Transfer data from PLC register → HMI LW register
3	Transfer data from HMI RW register → PLC register
4	Transfer data from HMI LW register → PLC register

Four consecutive word registers are used as described in the following table:

Address	Purpose	Description
[Trigger	Determine the	The valid values are listed in the
address]	direction of data	above table. When a new control
	transfer	code is written into the register,
		HMI will start to transfer. After data
		transfer is finished, the value will
		be set to 0.
[Trigger	The size of data	The unit is word.
address] +1	to transfer.	
[Trigger	Offset to the	Assume the value is "n", where n is
address] +2	start address of	an arbitrary number, the start
	PLC register	address of PLC register is [Trigger
	·	



		address + 4 + n].
		Take an OMRON PLC as an
		example:
		If [Trigger address] uses DM-100,
		[Trigger address + 2] will be
		DM-102. If the value in DM-102 is
		5, the start address of data source
		would be DM-109 (100 + 4 + 5 =
		109).
[Trigger	Offset to the	Take OMRON PLC as an example:
address] +3	start address of	If set [Trigger address] to DM-100,
	LW or RW	[Trigger address + 3] will be
	memory in HMI	DM-103. If the value in DM-103 is
		100, the start address of memory
		in HMI is RW-100 or LW-100.

Example 1

To use PLC Control object to transfer 16 words data in OMRON PLC, starting from address DM-100, to the HMI address, starting from RW-200. The setting is shown below:

- 1. Firstly, create a PLC Control object, set [Type of control] to [General PLC control], and set [Trigger address] to DM-10, that is, to use the four sequential registers start from DM-10 to control data transfer.
- 2. Confirm the data size and the offset addresses.
 - Set DM-11 to 16, since the number of words to transfer is 16 words.
 - Set DM-12 to 86, which indicates the address of data source is DM-100 (100=10+4+86).
 - Set DM-13 to 200, which indicates the destination address is RW-200.
- 3. Set DM-10 according to the direction of data transfer.
 - If set DM-10 to 1, the data will be transferred from PLC to HMI RW register,
 - If set DM-10 to 3, the data will be transferred from HMI RW register to PLC.

Back light control (write back) (eMT, iE, XE, mTV)

When [Trigger address] is turned ON, HMI backlight will be turned ON/OFF and [Trigger address] will be turned OFF. Any touch on the screen will turn the backlight on.

Back light control (eMT, iE, XE, mTV)

When [Trigger address] is turned ON, HMI backlight will turn ON/OFF and the state of [Trigger address] will not be changed.



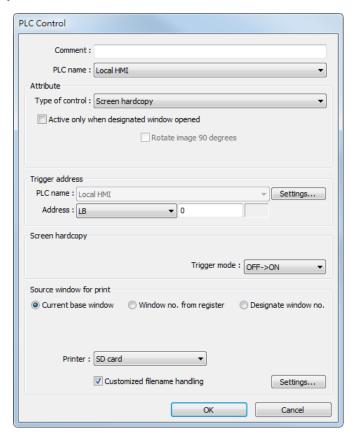
Sound control

When the state of the designated [Trigger address] changes, the HMI will play the sound selected from the sound library. There is a further selection determines whether the sound is played after Off to ON, ON to OFF transition, or at both of the changes of state.

Execute macro program

Select a pre-defined Macro from the drop-down list. When the state of the designated [Trigger address] changes, the selected Macro is executed. There is a further selection determines whether the Macro is executed after Off to ON, ON to OFF transition, or at both of the changes of state. If select [Always active when ON], the macro will be executed repeatedly. (The shortest time interval between runs is 0.5 second.)

Screen hardcopy



When the state of the designated [Trigger address] changes, print the selected screen. If select [SD card] or [USB disk] as [Printer], a "hardcopy" folder will be generated in the selected external device for saving the printed screen in JPG format. The name of the JPG files starts from yyyymmdd 0000.

To print the screen using a printer, go to System Parameter Settings » Model tab and set the printer.

To print the screen using a remote printer, go to System Parameter Settings » Printer/Backup Server tab and configure the parameters.

There are three options to specify the source window for hardcopy:



Current base window

Print the base window currently opened.

Window no. from register

Print the window designated by the value in a designated word address.

Designate window no.

Directly select a window to be printed.

Customized File Handling

This feature can be used to customize naming of the folders and the JPG files.

Setting	Description
Folder name	The folder name can be an alphanumeric name, and
	certain half-width symbols are allowed:
	!@#\$%^&()_+{}`-=;',.
	The folder name can also be specified by a naming syntax
	Dynamic format
	The folder names can be set by a designated word
	address, or by a naming syntax indicating the current
	system time. The syntax can be specified by selecting
	time buttons or entering the syntax in Format field. The
	length limit is from 1 to 25.
	Note: Up to 10 layers of folders can be created. The
	exceeding layers will be ignored.
File name	The way to specify a file name is similar to specifying a
	folder name.
	Note: If the file name already exists, the system will add
	"_0001" to the file name as a serial number. The numbers
	of the later files add up until "_9999". The files after
	"_9999" will be ignored.
	For example, if the three file names exist: "A.jpg",
	"A_0001.jpg", "A_0003.jpg". When trigger screen
	hardcopy with the same file name, the coming files will
	be named in this order: "A_0002.jpg", "A_0004.jpg",
	"A_0005.jpg", and so on.



The [Printer] setting is not available for cMT Series. The window hardcopy file is saved in iPad Photo folder.



A background printing procedure is performed when the printed window is not the current base window.

- If the hard-copied window is a background window, its [Direct Window] and [Indirect Window] objects will not be printed.
- When using a dynamic format name, the system will use a "_" sign as a substitute for invalid symbols.
- When using a dynamic format name, if screen hardcopy is triggered without specifying the format first, the system will save the file in the default directory, which is: hardcopy\yymmdd_0000.JPG



13.28. Scheduler

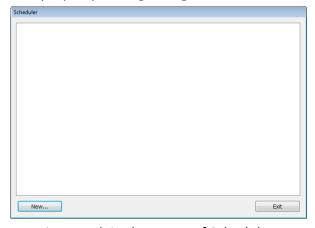
13.28.1. Overview

Scheduler object turns bits ON/OFF, or writes values to word registers at designated start times. It works on a weekly basis.

13.28.2. Configuration



Click the Scheduler icon on the toolbar to open the Scheduler management dialog box, click [New] to open the Scheduler property setting dialog box.

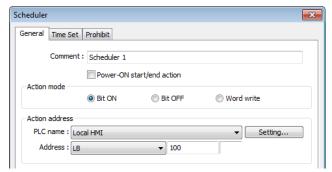


The following two demonstrations explain the usage of Scheduler.

Example 1

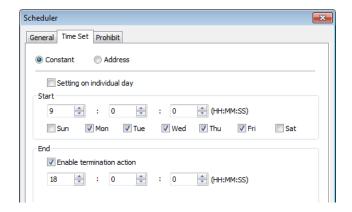
A motor is scheduled to power - ON at 9:00 and power - OFF at 18:00, Monday to Friday. We are using LB-100 to control the motor state. LB-100 will be set ON at 9:00 and OFF at 18:00.

- Click the Scheduler icon on the toolbar to open the Scheduler management dialog box, click [New].
- 2. In [General] tab, select [Bit ON] in [Action mode] and set [Action address] to LB-100.



In [Time Set] tab, select [Constant].





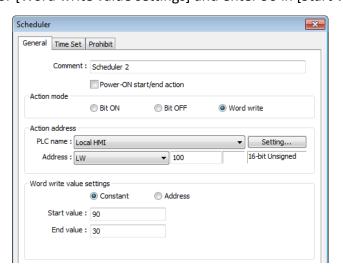
4. Enter [Start] time as 9:00:00 and select Monday to Friday. Do not select [Setting on individual day].

- 5. Enter [End] time as 18:00:00 and select [Enable termination action] check box.
- Click [OK], a new Scheduler object will be created on the [Scheduler] list.

Example 2

A thermal heater is scheduled to heat up to 90°C at 08:00 and cool down to 30°C at 17:00, Monday to Friday. LW-100 is used to store the set point value.

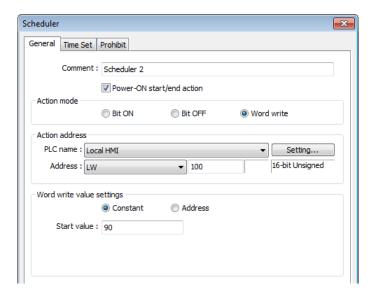
- Click the Scheduler icon on the toolbar to open the Scheduler management dialog box, click [New].
- 2. In [General] tab, select [Word write] in [Action mode] and set [Action address] to LW-100.
- 3. Select [Constant] for [Word write value settings] and enter 90 in [Start value].



- 4. In [Time set] tab select [Constant].
- 5. Enter [Start] time as 8:00:00 and select Monday to Friday. Do not select [Setting on individual day].
- 6. Enter [End] time as 17:00:00 and select [Enable termination action] check box.
- 7. Return to [General] tab and enter 30 in [End value].
- 8. Click [OK], a new schedule object will be created on the [Scheduler] list.



General Tab



Setting

Power ON start/end action

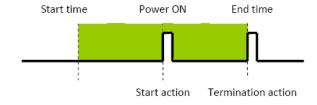
Description

Execute the defined action when the HMI is powered ON.

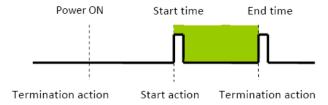
Enabled

When HMI is powered ON within the scheduled time range, the start action will be performed automatically. When HMI is powered ON outside the scheduled time range, the termination action will be executed.

Inside scheduled range



Outside scheduled range



Disabled

When the HMI is powered ON at a time later than the start time, the start action will not be performed, but the termination action will be performed. When the termination action is not defined, the scheduled range is not recognized and no action is performed.



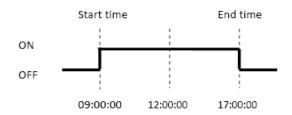
Action mode

Choose the action to do at the given time.

Bit ON

At the start time, set the designated bit ON. At the end time, set the designated bit OFF.

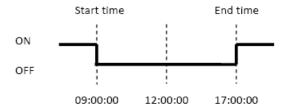
Example: Start time: 09:00:00 End time: 17:00:00



Bit OFF

At the start time, set the designated bit OFF. At the end time, set the designated bit ON.

Example: Start time: 09:00:00 End time: 17:00:00



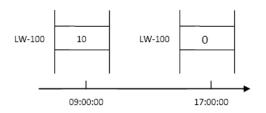
Word write

The [Write start value] entered here is transferred to the designated [Action address] word register at the start time. At end time, the [Write end value] entered here is written to the [Action address]. The valued can be entered manually or be set by using [Address] mode. In [Address] mode, the value in the specified address is the start value where the value in [Address + 1] is the end value.

Example: Device address: LW-100 Start time: 09:00:00 End time: 17:00:00 Write start value: 10 Write end value: 0

Use register: If control address is LW-n, then enter 10 in LW-n and

enter 0 in LW-(n+1).



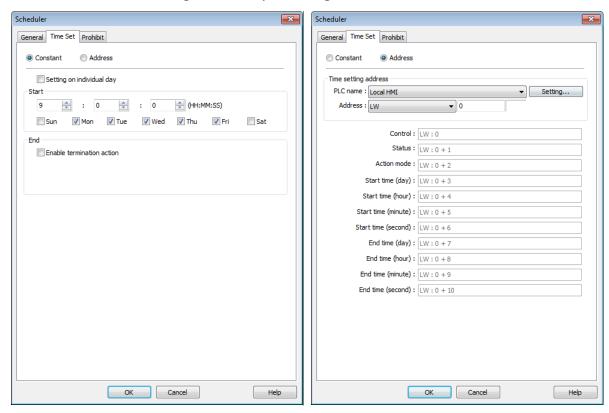




Only is an [End time] is set in the [Time set] tab will the [Write end value] box appear.

Time Set

Specify start time and end time. [Constant] allows specifying a date or period and time. [Address] allows controlling the time by the designated address.

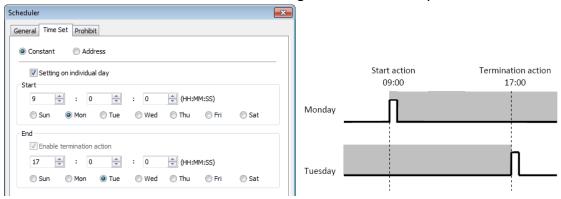


Constant

Setting on individual day

If [Setting on individual day] is selected

The same start time and end time can be assigned to different days of the week.



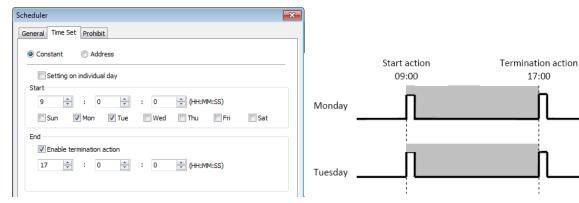




- Start and end time must be entered.
- Start and end time must be on a different time, or same time but different day.

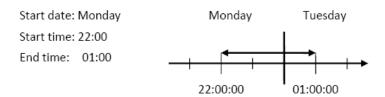
If [Setting on individual day] is not selected

Start time and end time entered must start and end within 24-hours.





- Start time and end time must be on a different time, different day.
- If an end time is earlier than a start time, the end action will occur in the next day.



Address

The scheduler object retrieves the start/end time and day of week information from word registers, enabling all parameters to be set and changed under PLC or user control.

Designated as the top address in a block of 11 sequential registers which are used to store time setting data.

The format of the 11 word registers should normally be 16-unsigned integer. If a 32-bit word address is chosen, only bits 0-15 are effective, and bits 16-31 should be written as zero.

The following describes each register.

Control (Time setting address + 0)

When [Control] bit is ON, the HMI will read and update [Action mode], [Start time], and [End time] values.



Bit 0: no action 1: read times/action mode



17:00



HMI will not regularly read the data from [Action mode] (address + 2) to [End time] (address + 10). Please turn [Control] ON when the settings are changed.

Status (Time setting address + 1)

When the read operation is completed, Bit00 of this register turns ON. If time data read is out of range or incorrect in any way Bit01 turns ON.

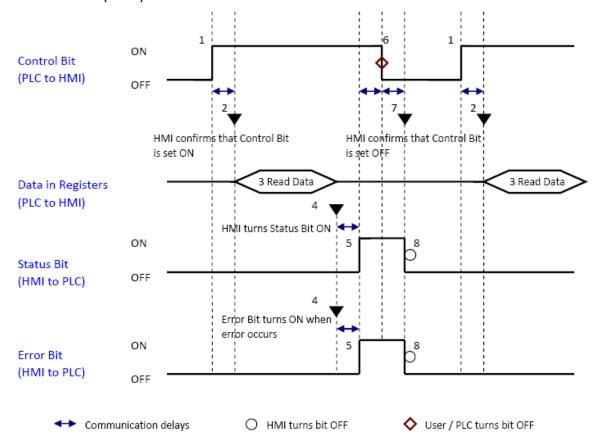
15	02	01	00	Bit
Reserved (0 fixed)		0	0	

Bit 00: Status bit: Read operation completed. (0: reading or reading not started. 1: reading completed.)

Bit 01: Error bit: Start or end time format incorrect. (0: corrected 1: error)



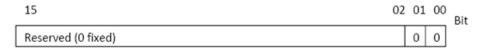
After the scheduler reads the data and the status is turned ON (The value in [Address + 1] = 01), the control bit must be turned OFF (address = 0). The status bit and error bit will be turned OFF (1→0) at the same time.





Action mode (Time setting address + 2)

Enable/disable [Enable termination action] and [Setting on individual day]. Whatever the [Enable termination action] bit is, all the time data, from [Control] to [End time (second)], will be read.



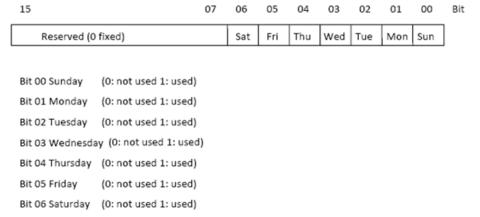
Bit 00 Enable termination action (0: Disabled 1: Enabled)
Bit 01 Setting on individual day (0: Disabled 1: Enabled)



- If [Enable termination action] is OFF, all 11 registers are still read but end time is ignored.
- If [Setting on individual day] is ON, make sure that all start end times are entered. If more than one start / end day bit is ON, and error will occur.

Start/End Day (Start Day: Time setting address + 3, End Day: Time setting address + 7)

Designates which day of week is used to trigger the start or end action.



Start/End Time (Start Time: Time setting address + 4 to + 6, End Time: Time setting address + 8 to + 10)

Hour: 0 – 23 Minute: 0 – 59 Second: 0 - 59 Values outside these ranges will cause error.

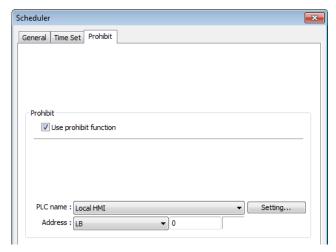


- 16-bit unsigned integer format must be used; BCD format is not supported here.
- End time depends on [Action mode] (address + 2). [Enable termination action] (Bit 00) and [Setting individual day] (Bit 01) are related:

Setting individual day	Enabled	Disabled	
Enable termination action	Enabled	Enabled	Disabled



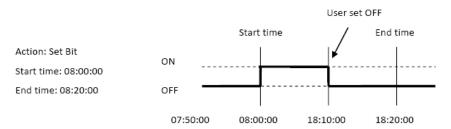
Prohibit tab



Before the scheduled action is performed, the HMI will read the specified bit state. If it is ON, the scheduled start/end action will be skipped. Otherwise, it will be performed normally.



- Up to 32 scheduler objects are allowed.
- A time schedule applies one action only when the start time is reached.



- [Write start/end value] and [Prohibit] bit is read only once before start action. After that, even to change the state of [Prohibit] bit or [Write start/end value], the end action and the value written will not be affected. Also, to read data of [Write start/end value] and [Prohibit] bit, there is a delay of start action due to the communication.
- Each time RTC data is changed, scheduler list entries that possess both start and end times will be checked for in-range or out-range conditions. For in-range, the start action will occur. If the end action is not set, the new range is not recognized, the action will not occur.
- If several Scheduler objects are set to the same start time or end time, the action is performed in ascending order of the schedule number.
- In [Time Set] » [Address] mode, the system will read [Control] word regularly. The length of the period depends on the system.
- In [Time Set] » [Address] mode, when start time and end time is out-range, error occurs in the set action time. (Note: BCD is not an acceptable format)
- In [Time Set] » [Address] mode, the action will not start up until the first time the time data is successfully updated.

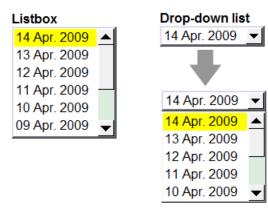


13.29. Option List

13.29.1. Overview

Option List object displays a list of items that the user can view and select. Once the user selects an item, the corresponding data will be written to a word register.

There are two forms of this object – [List box] and [Drop-down list]. The [List box] lists all items and highlights the selected one. The [Drop-down list] normally displays only the selected item. Once the object is pressed, the system will display a list (which is similar to list box) as shown in the following figure.

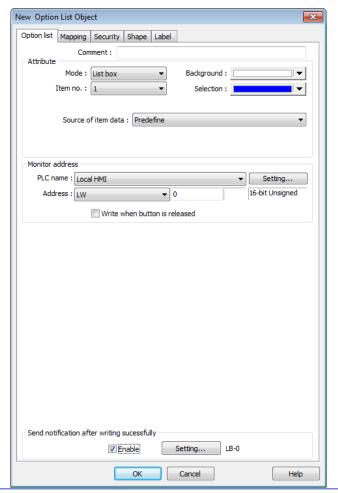


13.29.2. Configuration



Click the Option List icon on the toolbar to open an Option List object property dialog box. Set up the properties, press OK button, and a new Option List object will be created.

General Tab



Setting

Description

Attribute

Mode: The list style, either [List box] or [Drop-down list].

Item no.: Set the number of items for the object. Each item represents a state displayed in the list and the corresponding value will be written to the [Monitor address].

Background: Set background color.

Selection: Set background color for the selected item.

Source of item data: There are 4 sources available: [Predefine], [Dates of historical data], [Item address], and [User account]. See 13.29.2.1..

Monitor address

The corresponding value of the selected item will be written to [Monitor address].

Write when button is released

If this check box is selected, the selected item value will be written to [Monitor address] after the button is released.



Send
notification
Set On/Off the designated bit address after successfully writing
after writing
successfully
successfully



For cMT Series, the [Dates of historical data] and the [write when button is released] selections are not available.

13.29.2.1. Source of item data

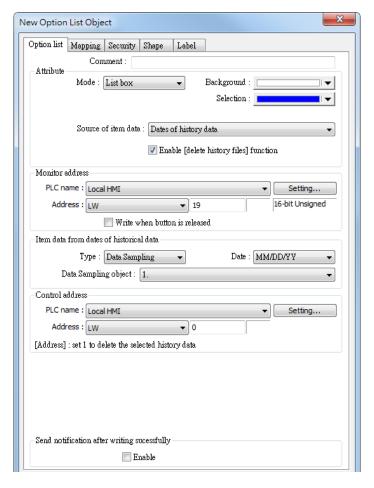
Predefine

The list is manually defined in [Mapping] tab.

The number of items can be adjusted by [Item no.], and each item represents one state. Each item has a corresponding value which will be written to [Monitor address].

Dates of historical data

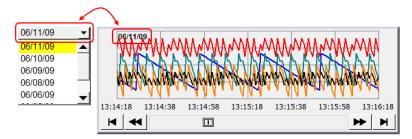
This selection is not available for cMT Series.



Option List object can be used with historical data display objects, such as Trend Display object, History Data Display object and Event Display object to control which history file should be



shown. The figure below is an example of Option List used with Trend Display.



Setting	Description	
Туре	Two options are available: [Event (Alarm) log] and [Data sampling].	
Date	Set the date format. YYYY means a four digits year (EX: 2012), YY	
	means a two digits year (EX: 12), MM means month and DD means	
	day.	
Data	Select which Data Sampling object is displayed when [Type] is [Data	
Sampling	Sampling], and it should be the same as the [Data sampling object	
object	index] configured in [Trend Display] or [History Data Display].	
Enable		
[delete	If selected, a control address can be set. Writing "1" to this address	
history data]	will delete the history data of the specified date.	
function		



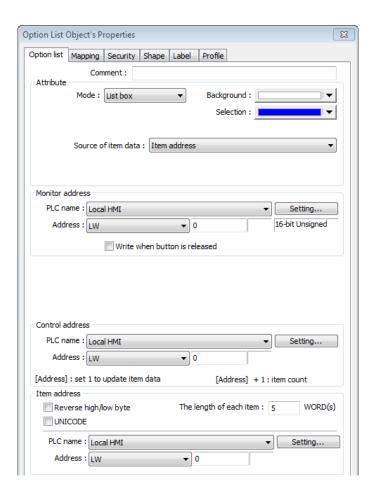
- In [Dates of historical data] mode, since the system automatically reads the historical data and finds the date information, it is not necessary to configure in the [Mapping] tab.
- The error message displayed in Option List can be modified in [Mapping] tab.

Item	Value	Item data
▶ 0 (error)		Error!!

Item address

The list will be read from the given [Item address] and controlled by [Control address]. The following options will be available:





Setting	Description
Control	[Address]: If the value at this address is changed to 1, the option
address	list would be replaced by items defined at [Item address]. After
	updating, the value will be restored to 0.
	[Address + 1]: Define the number of items in [Item address].
Item address	Assign the item address
	UNICODE
	The item will use UNICODE characters, such as Chinese characters.
	The length of each item
	Define the number of letters for each item, the unit is Word.

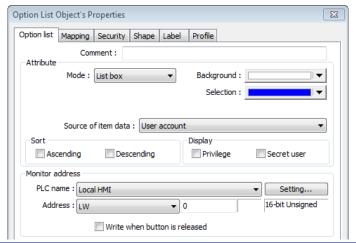


- The UNICODE characters used here should be used by Text object, so that EasyBuilder Pro will compile the needed fonts and download these fonts to HMI, then the UNICODE letters can be correctly displayed.
- [The number of items] multiplied by [The Length of each item] must be less than 1024 words.
- The system automatically disables [Mapping] tab in [Item address] mode.



User account

If [Enhanced Security] mode is enabled, [User account] would appear in the [Source of item data] and it lists the names of users.



Setting	Description	
Sort	Select the sorting method from [Ascending] of [Descending].	
Display	If [Privilege] is selected, the privileges for each user will be	
	displayed in option list.	
	If [Secret user] is selected, even though it is defined to be hidden in	
	[System parameter settings] » [Security] » [Enhanced Security], the	
	users will still be displayed in [Option List].	

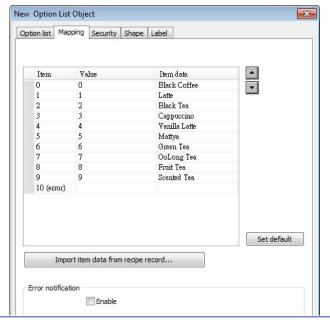


The address that controls user index is [Control Address +2 (LW-n+2)] which is set in [System Parameters] » [Security] » [Enhanced Security].

Mapping Tab

This table displays all available states/items, their item data and values. To change the number of available items, please go to [Option list tab] » [Attribute] » [Item no.].





Setting

Description

Item

The system lists all available items. Each item represents a state that will be displayed in the list. This field is read-only.

Value

Here user can assign value for each item, basing on the following two criteria:

For reading: If the value in [Monitor address] is changed, the object selects the first-matched item. If no item is matched, the status goes to error state and signals the notification bit register (if requested).

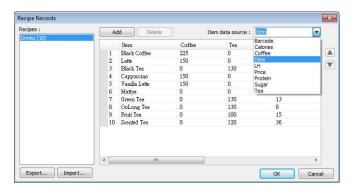
For writing: The system writes this value to [Monitor address] when user selects an item.

Item data

Text displayed for each item. The Option List object displays the text of all items in the list for users to review and select.

Import item data from recipe record

This feature is enabled when select [Recipe-Selection] as [Monitor address]. Click [Import item data from recipe record] to open the [Recipe Records] setting dialog box. Select [Item data source], the data belonging to the selected column will all be imported to Option List object.



Before importing, the number of items in Option List changes



according to the number of items defined in Recipe Records.
After importing, modifying Recipe Records will not change the
content of Option List.
On error state, the list box removes the highlight to represent no item is selected and the drop-down list displays the data of error state. Only the drop-down list uses error state, list box is not able to use error state.
For example, item number 8 is the error state when specifying 8 in [Item no.]. (The first item number is 0)
Reset all values or states to default. That is, set 0 for item 0, 1 for item 1, and so on.
The system will set ON/OFF to the specified bit register when error
is detected. The signal of the bit register could be used to trigger a procedure for correcting the error by using objects such as Event



13.30. Timer

13.30.1. Overview

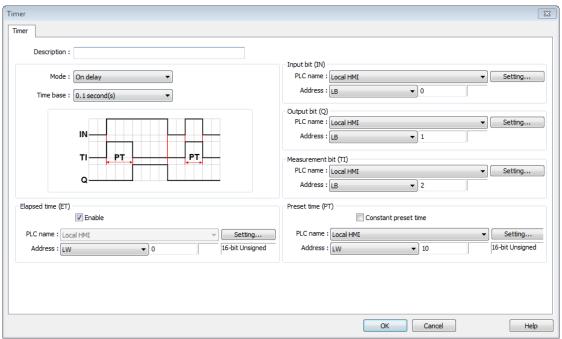
Timer object is a switch that can be used to control the mode to count time. The modes are explained later. Timer object uses the following 6 variables:

Timer Variable	Туре	Description
Input bit (IN)	Bit	The main switch of Timer.
Measurement bit (TI)	Bit	Turns ON when the Timer begins
		counting time.
Output bit (Q)	Bit	Activated when the Timer finishes
		counting time.
Preset time (PT)	Word	Presets a time before the Timer
		begins counting time.
Elapsed time (ET)	Word	Displays the elapsed time.
Reset bit (R)	Bit	Resets the elapsed time (ET) to 0.

13.30.2. Configuration



Click the Timer icon on the toolbar to open the property dialog box as shown in the following figure.

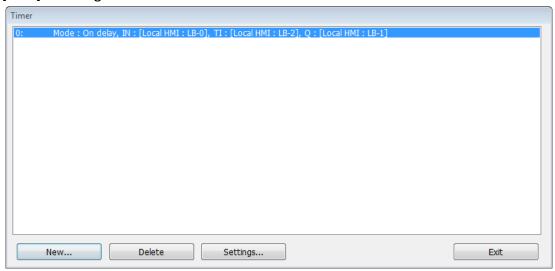




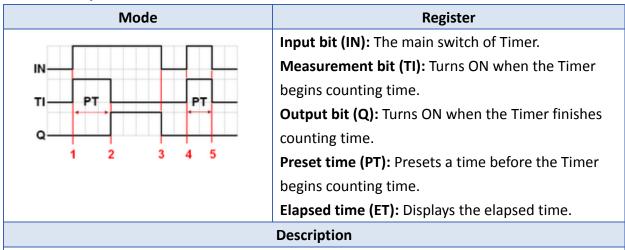


[Constant preset time] is only available for cMT series.

If use cMT Series, clicking the Timer icon on the toolbar will open the Timer managing window, click [New] to configure.



On delay



Period 1: When the IN turns ON, TI turns ON and the ET starts counting. The Q remains OFF.

Period 2: When the ET equals to the PT, the TI turns OFF and the Q turns ON.

Period 3: When the IN turns OFF, the Q turns OFF and the ET is reset to 0.

Period 4: When the IN turns ON, the TI turns ON and the ET starts counting. The Q remains OFF.

Period 5: Turns IN OFF before the ET reaches the PT, the TI turns OFF, and the ET is reset to 0. Since the ET doesn't reach the PT, the Q remains OFF.



Off delay

Mode	Register
	Input bit (IN): The main switch of Timer.
IN	Measurement bit (TI): Turns ON when the Timer
TI PT PT	begins counting time.
Q	Output bit (Q): Turns OFF when the Timer finishes
	counting time.
1 2 3 4 5 6	Preset time (PT): Presets a time before the Timer
begins counting time.	
Elapsed time (ET): Displays the elapsed time.	
Description	

Period 1: When the IN turns ON, the TI remains OFF and the Q turns ON, the ET is reset to 0.

Period 2: When the IN turns OFF, the TI turns ON and the Q remains ON, the ET starts counting.

Period 3: When the ET equals to the PT, the Q and TI turn OFF.

Period 4: When the IN turns ON, the TI remains OFF and the Q turns ON, the ET is reset to 0.

Period 5: When the IN turns OFF, the TI turns ON and the Q remains ON, the ET starts counting.

Period 6: Turns the IN to ON before the ET reaches the PT, the TI turns OFF, the Q remains ON, and the ET is reset to 0,.

Pulse

Mode	Register	
	Input bit (IN): The main switch of Timer.	
IN	Measurement bit (TI): Turns ON when the Timer	
TI PT PT	begins counting time.	
"	Output bit (Q): Turns ON when the Timer begins	
Q	counting time and turns OFF when the Timer	
1 2 3 4	finishes counting time.	
	Preset time (PT): Presets a time before the Timer	
	begins counting time.	
Elapsed time (ET): Displays the elapsed time.		
Description		

Period 1: When the IN turns ON, the TI and Q turn ON simultaneously, and the ET starts counting.

Period 2: When the ET equals to PT, the TI and Q turn OFF simultaneously. Since IN is turned OFF when counting time, the ET is reset to 0.

Period 3: When the IN turns ON, the TI and Q turn ON simultaneously, and the ET starts counting.

Period 4: When the ET equals the PT, the TI and Q turn OFF simultaneously.



Accumulated ON delay

Mode	Register
	Input bit (IN): The main switch of Timer.
IN	Measurement bit (TI): Turns ON when the Timer
TI PT PT PT	begins counting time.
R	Output bit (Q): Turns ON when the Timer finishes
Q	counting time.
1 2 3 4 5 6 7	Preset time (PT): Presets a time before the Timer
	begins counting time.
	Elapsed time (ET): Displays the elapsed time.
	Reset bit (R): Resets ET to 0
	Description

Period 1: When the IN turns ON, the TI turns ON and the elapsed time ET starts counting, the Q remains OFF.

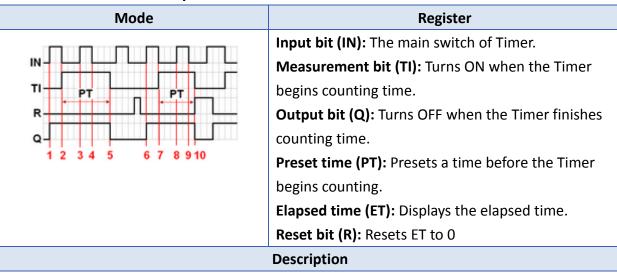
Period 2: When the IN turns OFF, if the ET doesn't reach the PT, the TI turns OFF, and at the same time the Q remains OFF. The ET is in the retentive state.

Period 3: When the IN turns ON, the TI turns ON. The timer measurement starts again and the ET starts counting from the kept value. The Q remains OFF.

Period 4: When the ET reaches the PT, the TI turns OFF and the Q turns ON.

Period 5: When the IN turns OFF, the Q turns OFF. Turning ON the reset bit R will reset the ET to 0, and then the reset bit turns OFF.

Accumulated OFF delay



Period 1: When the IN turns ON, the TI remains OFF and the Q turns ON.

Period 2: When the IN turns OFF, the TI turns ON and the Q remains ON. The ET starts counting.

Period 3: When the IN turns ON, the TI and Q remain ON, and the ET is in the retentive state.

Period 4: When the IN turns OFF again, the ET starts counting from the kept value.

Period 5: When the ET equals to the PT, the TI and Q turn OFF simultaneously. Turning ON the reset bit R will reset the ET to 0, and then the reset bit turns OFF.



13.31. Video In and Video In (USB Camera)

13.31.1. Overview

The eMT, XE, and mTV Series HMI models provide the Video Input feature. By installing a surveillance camera, user can monitor the site on HMI. The video images can be stored in external devices and then analyzed on PC. This feature can be utilized in different places for monitoring, such as vehicles or buildings.

eMT, XE, and mTV Series: Support USB camera video input.

eMT3120A/eMT3150A: Not only support USB camera video input but also NTSC and PAL analog video systems. For hardware, HMI provides 2 channels for Video Input. User can freely switch the channel, and capture real-time images even when Video Input is paused.

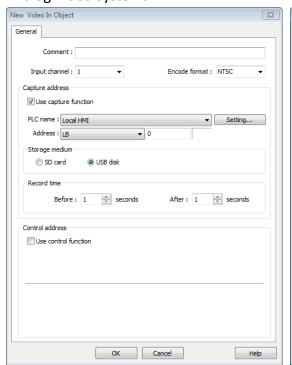
13.31.2. Configuration



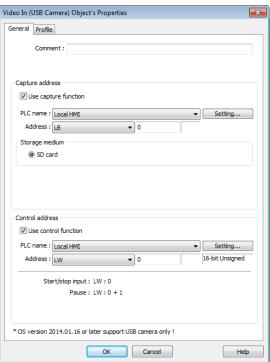
Click the Video In icon on the toolbar to open the property dialog box. Set up the properties, press OK button, and a new Video In object will be created.

General Tab

Analog Video Systems



USB Camera





Setting	Description		
Input channel	Select the Video Input channel from channel 1 or channel 2.		
	(Analog video systems)		
Encode	Salast the format from NTSC or DAL (Analog video systems)		
format	Select the format from NTSC or PAL. (Analog video systems)		
Capture	Select [Use capture function] check box and configure the settings.		
address	Capture address		
	Designate the address that triggers image capturing.		
	Storage medium		
	Designate the storage device.		
	Contains Characa Davides		

System	Storage Device
Analog video	Select SD card or USB disk to save the captured
system	images. The images of channel 1 will be saved in
	"VIP1" folder in the chosen storage and so on.
USB	Only saves the captured images in SD card.
Camera	

Record time

Set a period of time to capture the images.

System	Method
Analog video	The longest period can be set from 10
system	seconds before triggering [Capture address]
	to 10 seconds after triggering.
	The time interval of image capturing is once
	every second.
	The captured .jpg file will be named in the
	following format:
	Before or after [Capture address] is
	triggered: YYYYMMDDhhmmss.jpg
	The moment that [Capture address] is
	triggered: YYYYMMDDhhmmss@.jpg
	For example, set [Record time] "Before" and
	"After" to "5" seconds. When the state of [Capture
	address] changes from OFF to ON, the system will
	start capturing one image per second, from 5
	seconds before the triggering time to 5 seconds
	after the triggering time, which is 11 images in
	total including the one captured at the triggering
	moment.



USB	Only the image of the triggering moment is
Camera	captured. The name format:
	YYYYMMDDhhmmss.png.

Control address

Use control function

If enabled, enter certain value to the control address and the following addresses can control Video Input object. For example, if the designated control address is LW-n (n is any address), enter certain value to the designated addresses will execute commands as the following table.

Address	Value	Command
LW-n	0	Stop displaying image
	1	Open channel 1 and display the
		image on HMI
	2	Open channel 2 and display the
		image on HMI
	3	Open channel 1 but don't display the
		image on HMI (Capture function
		operable)
	4	Open channel 2 but don't display the
		image on HMI (Capture function
		operable)
LW-n+1	1	Pause / resume the video
LW-n+2	1~100	Adjust the contrast ratio
		(Analog video systems)
LW-n+3	1~100	Adjust the brightness
		(Analog video systems)

- After changing the value in [Control address (LW-n)], the system will keep the new value.
- After changing the value in [Control address + 1 (LW-n+1)], the system will execute the command and then reset the value to 0.
- If [Use control function] check box is not selected, the system will play the image of the selected channel.
- If [Display adjustment] check box is selected, the contrast ratio and brightness can be adjusted. (Analog video systems)
- The USB Camera is controlled by LW-n (value 0 or 1) and LW-n+1.





About analog video systems:

- Only one channel can be opened at a time.
- Real-time images can still be captured when Video In is paused.
- Recommended analog video systems and resolutions:

	1:1	50%
NTSC	720 x 480	360 x 240
PAL	720 x 576	360 x 288

About USB Camera:

- If the USB Camera is removed during video playing, the image will not be loaded even though the USB Camera is returned. If [Control address] is selected, please stop and then restart video input. If [Control address] is not selected, please switch to another screen and then return, or restart HMI.
- The maximum size of Video In object of eMT3070A is 340*240, as for eMT3105P, eMT3120A, eMT3150A, XE, and mTV Series, the maximum size of Video in object is 640*480.
- When using USB Camera, the resolution of the run-time video image is determined by the resolution supported by the USB Camera that is closest to the size of Video In object . The resolution supported by the USB Camera may not be identical to the size of the object. The same resolution of Video In object and USB Camera image is recommended.
- When using USB Camera, the right and bottom edge of the Video In object will keep a distance of 50 pixels away from the window edge to prevent the run-time video image from exceeding the window.
- When using USB Camera, the background color of Video In object is black. If the resolution of the run-time video image is smaller than Video In object, the empty area is colored black. The same resolution of Video In object and USB Camera image is recommended.
- The tested and available USB Cameras are: Logitech C170, Logitech C310, Logitech C910, LifeCam VX-2000.
- The OS versions that support USB Camera:

Model	OS Version (or later)
eMT3070A	20140116
eMT3105P, eMT3120A, eMT3150A	20140701
XE Series	20140624
mTV	20140807



13.32. System Message

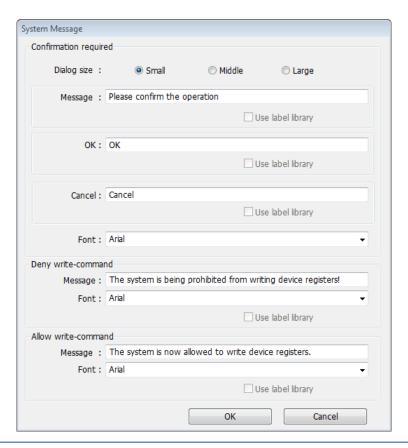
13.32.1. Overview

If objects use [Display confirmation request] or [local HMI supports monitor function only] is turned on/off, the corresponding messages configured here will be displayed in pop-up message boxes.

13.32.2. Configuration

Click the System Message icon and on the toolbar to open the setting dialog box.

System Message



Setting	Description
Dialog Size	Select the size for pop-up window and texts.
Confirmation	If an object uses [Display confirmation request], this message
required	would pop up when the object is used. [Message] shown on
	confirmation dialog box, and the text label of the 2 buttons, [OK]
	and [Cancel], can be set. Please use the same font for the labels of
	[Message], [OK] and [Cancel]. Additionally, only when selecting



	[Label Library] for [Message], the use of Label Library for [OK] and
	[Cancel] buttons can be enabled.
Deny	Displays when system tag LB-9196 (local HMI supports monitor
write-command	function only) is turned ON.
Allow	Displays when system tag LB-9196 (local HMI supports monitor
write-command	function only) is turned OFF.



■ cMT-SVR does not support adjusting dialog size and using system tag LB-9196.



13.33. Recipe View

13.33.1. Overview

Recipe View object can be used to display a specific recipe. All items and values of the recipe can be viewed by using this object.

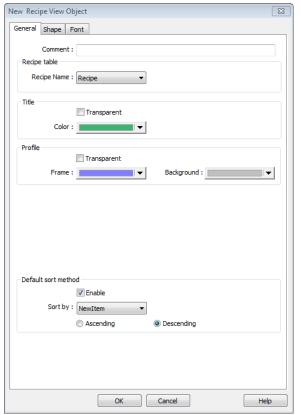
13.33.2. Configuration



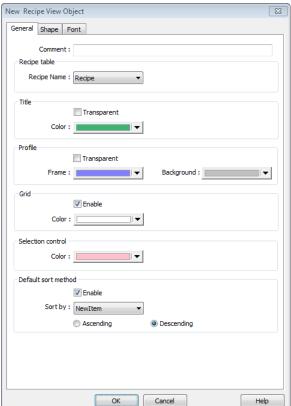
Click the Recipe View icon on the toolbar to open a Recipe View object property dialog box. Set up the properties, press OK button, and a new Recipe View object will be created.

General Tab

cMT Series



eMT, iE, XE, mTV Series



The name of each part of the Recipe View object is shown in the following figure.



Setting	Description
Recipe table	Choose the recipe name or look for other recipes from the
	drop-down list.
Title	The item name assigned in [System Parameter Setting] » [Recipe].
	Transparent
	If selected, the title row has no shading; the color selection is not
	available.
Profile	The frame and background color of the object can be set.
	Transparent
	Select to hide the background, the color selection is not available.
Grid	The dividing lines between columns and rows.
(N/A for cMT)	Enable
	Select to show the grid.
Selection	
Control	Change the shading color of the selected row.
(N/A for cMT)	
Default sort	Configure how the records are sorted. [Ascending] and
method	[Descending] can be selected.

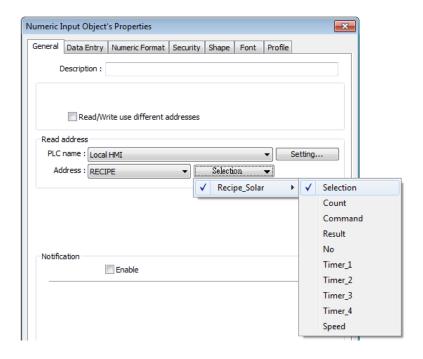


There are 4 system registers that can be used to view/update/add/delete recipe database:

Selection

Current selection of record in Recipe View object, and it is numbered from zero. If the first record is chosen, the value of Selection will be 0. When the value of Selection is changed, the corresponding values will be updated, such as "No", "Timer_1", "Timer_2", as shown in the following figure.





Count

Show the number of records in current recipe.

Command

Enter certain value will send command to the selected record.

Enter "1": Add a new recipe record next to the currently selected one.

Enter "2": Update the selected recipe record.

Enter "3": Delete the selected recipe record.

Enter "4": Delete all recipe records.

Result

View the result of executing commands.

Displays "1": Command successfully executed.

Displays "2": The selected record does not exist.

Displays "4": Unknown command.

Displays "8": Records reach limit (10000 records), no new records can be added.

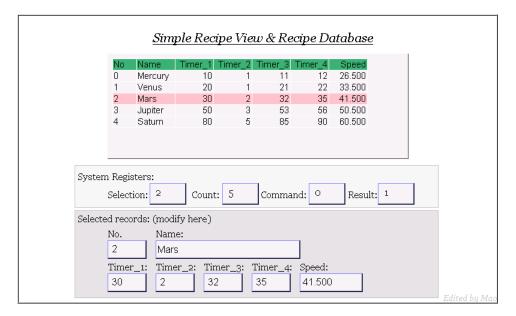
Please go to [System Parameter Settings] » [Recipes] tab to create the recipe data before using Recipe View object. See "5 System Parameter Settings".

About creating recipes, see "24 Recipe Editor".

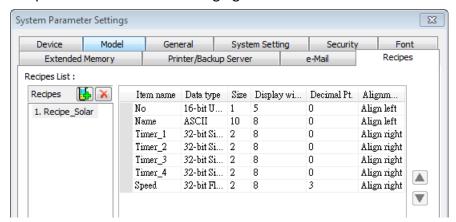


Example 1

In this example, a recipe database is created to be displayed by Recipe View object. When you select a recipe record on Recipe View object, the value of [Selection] and the corresponding values will change accordingly. When finish designing, you can modify the recipe database by entering a value in [Command].

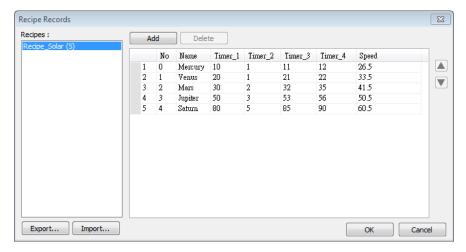


1. Create a recipe as shown in the following figure.

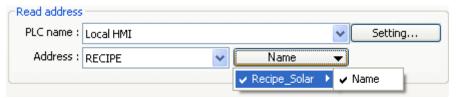


2. Use Recipe Records to create a number of records as shown in the following figure.





- 3. Create a Recipe View object and use the recipe database created in the preceding steps.
- 4. Create 4 Numeric objects using registers "Selection", "Count", "Command", and "Result".
- 5. Create corresponding input objects for "No", "Name", "Timer_1", ..., "Timer_4", "Speed".
 For example, "Name" is an ASCII item with size "10". Create an ASCII object and set device type to "RECIPE" » "Name".



- 6. The project is then completed.
- 7. As shown above, "Mars" is selected and the corresponding items are also updated. There are 5 records so the "Count" displays "5". Try selecting different rows of the Recipe View object. Fields "Name", "Timer_1", ...will change accordingly.
- **8.** Try the following operations:
- Add:

To add current data as a new record, enter "1" in "Command".

Update:

To update recipe database, enter "2" in "Command".

Delete:

To delete the selected record, enter "3" in "Command".

- Sort the items.
- Click the title to change the order.

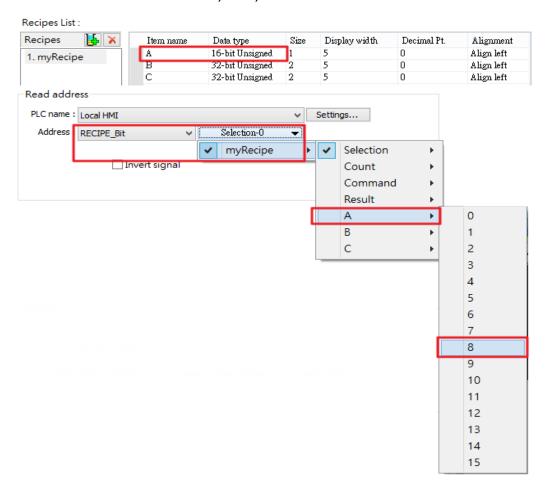


Example 2

In this example, [RECIPE_Bit] can be used to read / write individual bits of Recipe data.

Although BOOL type items cannot be added to Recipe Database, individual bit access of 16bit / 32bit data is possible.

As shown in the following figure, select [RECIPE_Bit] for the read address of Bit object and point to the target item, and then the available Bit selections will be displayed. In this manner, Recipe Database can be used to record, read, and write bit data.





13.34. Flow Block

13.34.1. Overview

Flow Block object displays the flow status of the blocks in the pipe or the status of the transportation lines. Unlike Moving Shape object which requires a precise measurement between two points when drawing a straight line provided by users, the blocks flow at a fixed interval in a horizontal or vertical straight line.

The features of Flow Block:

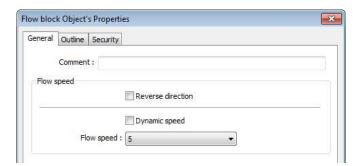
- Each section of the Flow Block must be a horizontal or vertical straight line and the blocks flow at a fixed interval within it.
- Dynamic speed and direction adjustment (Speed and direction can be controlled by a designated register.
- Security mechanism (Interlock), which hides Flow Block when the status of designated bit is invalid.

13.34.2. Configuration



Click on the Flow Block icon on the toolbar or select [Objects] » [Flow Block] to create object.

General Tab

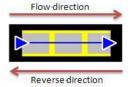


Setting

Description

Reverse direction

The blocks flow in the direction the object is drawn (the blue arrow). If select this check box, the blocks flow in the opposite direction.

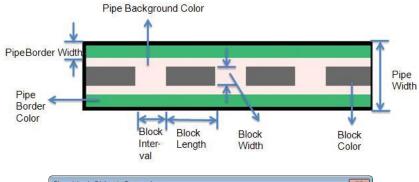


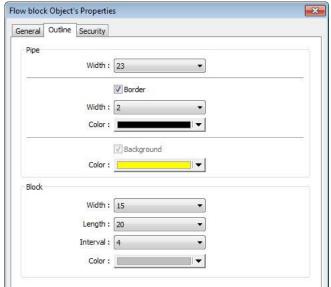


Dynamic	Read address
speed	The direction and speed at which the blocks flow can be controlled
	by a designated register. The valid rage is -25 to 25. When a
	negative value is entered, the blocks flow in a reversed direction.
	Setting
	Displays the address and format of the designated register. [System
	register], [Index register], and [Tag Library] can be set here.
Flow speed	25 flow speed levels, the valid range is 0 to 25 when [Dynamic
	speed] is not selected. A larger value indicates a faster speed.

Outline Tab

For setting the outline property of Flow Block. The following illustration shows each item.





Setting	Description
Pipe	Sets the properties of the pipe within which the blocks flow. The
	background color, border width and color can be set. When the
	[Border] check box is selected, the background color must be set.

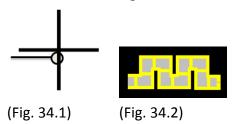


Block	Sets the properties of blocks. Width, length, interval and color can
	be set here.



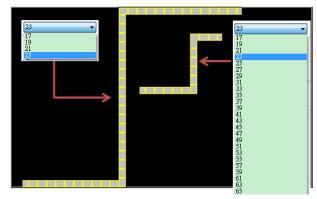
If both [Reverse direction] and [Dynamic speed] check boxes are selected in [General] tab, when entering a negative value in the designated register of dynamic speed, the blocks flow in the direction the object is drawn.

To avoid the pipe lines from overlapping when drawing a turn, there is a minimum width planned at each turn. As shown in Fig. 34.1, the sign on the cross cursor defines the minimum width. Fig. 34.2 demonstrates that each turn is drawn in the minimum width.



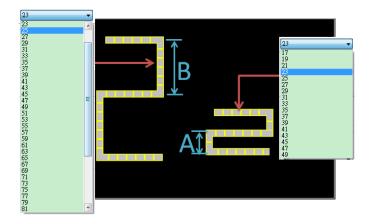
The valid range of the length, width, and height of the Flow Block can be adjusted according to the size of the object drawn and the size of the window.

As shown in the following figure, when the size of the Flow Block is larger, the valid range is restricted to prevent the flow block from exceeding the window size. When the size of the object is smaller, the adjustment range will be larger.



To prevent the flow block from overlapping itself, when the distance between two lines is shorter (Section A), the valid range is restricted. When the distance is longer (Section B), the adjustment range will be larger.

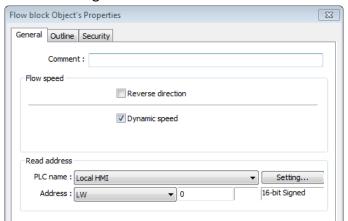




Example 1

The demonstration below shows how to use [Dynamic speed] to control the direction and speed of Flow Block by a designated word register.

Create a Flow Block object and select [Dynamic speed] check box. Set [Address] to LW-0, and set the format to 16-bit Signed.



Create a Numeric object, set [Address] to LW-0. The high limit is 25, and the low limit is 2. -25. The format is 16-bit Signed.



Execute simulation or download the project to HMI. When entering a positive value in 3. LW-0, the blocks flow in the direction the section is drawn. A larger value indicates a faster speed. When a negative value is entered, the blocks flow in a reversed direction, and the smaller value indicates a faster speed. When 0 is entered, it stops flowing.



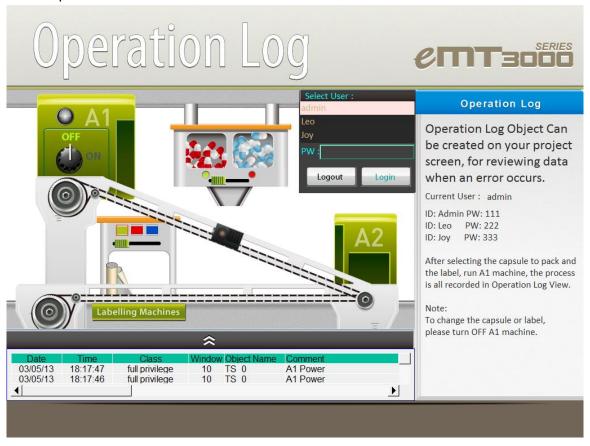
Click the icon to download the demo project. Please confirm your internet connection.

13.35. Operation Log

13.35.1. Operation Log Settings

13.35.1.1. Overview

Operation Log records user's operation steps and displays the record in real-time. When an error occurs, use operation log to analyze the problem. The backup tables can be used to review the process in order to resolve the errors.

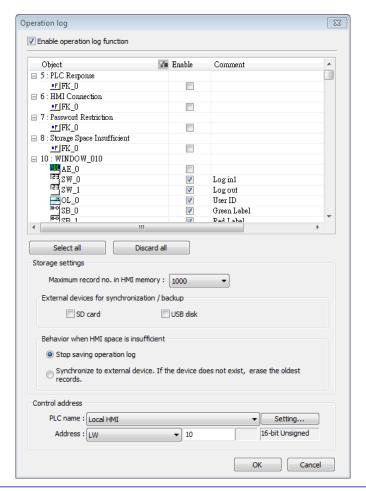


13.35.1.2. Configuration



Select the objects to be recorded. Click [Objects] on the main menu, point to [Operation Log], click [Operation Log Settings], and then select [Enable operation log function] check box.





Setting Description

Object

When Operation Log is enabled, the objects with write function are listed in the setting dialog box sorted by window numbers.

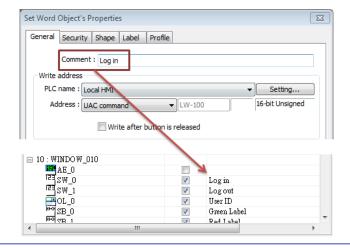
[Filter]: By clicking icon, the objects with write function are listed. Users can filter out the objects that need not to be recorded, and the log displays only the selected objects.

Enable

The selected objects are recorded by Operation Log.

Comment

The description of the object as shown in the following figure.





Select all	Selects all the listed objects. If [Filter] is used, clicking [Select all]		
	only selects the objects in the list.		
Discard all	Discards all the selected objects. If [Filter] is used, clicking [Discard		
	all] only discards the objects in the list.		
Storage	Sets the way the records are stored.		
settings	Maximum record no. in HMI memory		
	Sets the maximum number of records that can be stored in HMI		
	memory.		
	External devices for synchronization / backup		
	Stores backup data to SD card or USB disk.		
	Behavior when HMI space is insufficient		
	When HMI memory space is insufficient, two options are provided:		
	[Stop saving operation log]: Stops saving new records in order to		
	keep the earlier records.		
	[Synchronize to external device]: Stores the Operation Log to the		
	external device. When the device does not exist, the HMI clears the		
	oldest records in its memory.		
Control	Entering different values in the control address sends		
address	corresponding commands to Operation Log and returns the result		
	of executing the command.		
	If control address is LW-n (where n is an arbitrary number), the		
	address that returns the result of executing the commend is		
	LW-n+1.		
	Control address (LW-n):		
	(1): Clear all records.		
	(2): Copy the records to the USB disk.		
	(3): Copy the records to the SD card.		
	(4): Copy the records to the USB disk and clear the records in HMI		
	memory.		
	(5): Copy the records to the SD card and clear the records in HMI		
	memory.		
	Execution result (LW-n+1):		
	(0): Processing.		
	(1): Execution succeeded.		
	(2): The device does not exist.		
	(3): The record does not exist.		
	(4): Unknown error.		





 Operation Log can only record the operation of the objects that are manually triggered.
 Objects that cannot be manually triggered are not recorded, such as Time Based Data Transfer object.

- When running off-line or on-line simulation, Operation Log is stored under EasyBuilder installation directory: HMI_memory\operationlog\operationlog.db
- Triggering Macro with a Set Bit object generates two records, the triggering of bit and the triggering of Macro.

13.35.2. Operation Log View

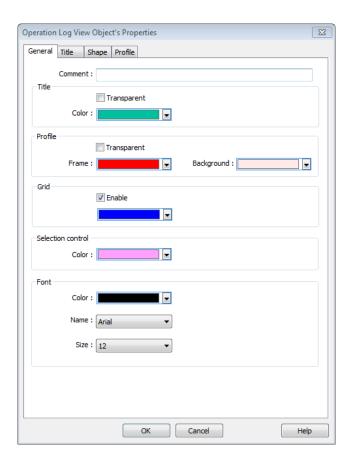
13.35.2.1. Overview

Operation Log View can be used to review the Operation Log.

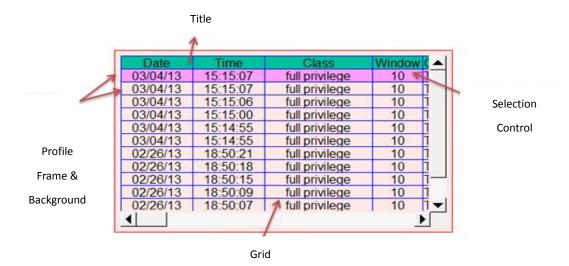
13.35.2.2. Configuration



Before using Operation Log View, please follow the steps described in the preceding part to finish Operation Log Settings. Click [Objects] on the main menu, point to [Operation Log], and then click [Operation Log View].

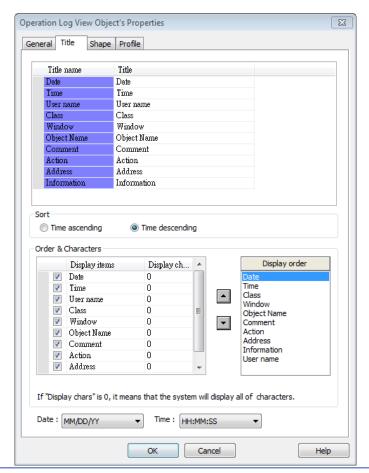






Setting	Description	
Title	Sets the color of the title row.	
	Transparent: If selected, the title row will be transparent. The color	
	selection is not available.	
Profile	Sets the color of the frame and background of the object.	
	Transparent: Hides the frame and background. The color selection	
	is not available.	
Grid	Sets the color of the dividing lines between the columns and rows.	
	Enable: If selected, displays the grid, otherwise, hides the grid.	
Selection control	Sets the color of the selected row.	
Font	Sets the color, font, and font size of the text displayed in Operation	
	Log View object.	

Title Tab



Setting	Description	
Title	Sets the title displayed in Operation Log View object.	
Sort	Sorts the records in time ascending or descending order.	
Display order	Sets the order of the displayed item. If [Display chars.] is 0, all characters are displayed.	
Date / Time	Sets the format of date and time displayed in Operation Log View object.	

13.35.3. Operation Log Printing

13.35.3.1. Overview

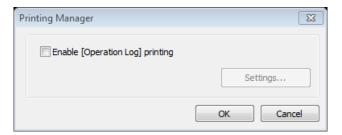
Operation Log Printing can generate an Operation Log sheet by printing out using a printer or by saving as JPEG file into an external device. Before using this function, please go to Operation Log Settings to finish the settings.

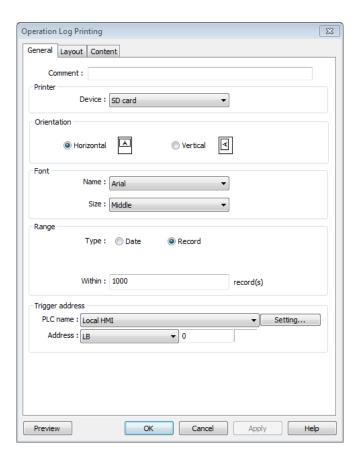


13.35.3.2. Configuration



Select "Enable [Operation Log] printing" check box and click [Settings] button to open the Operation Log Printing dialog box.



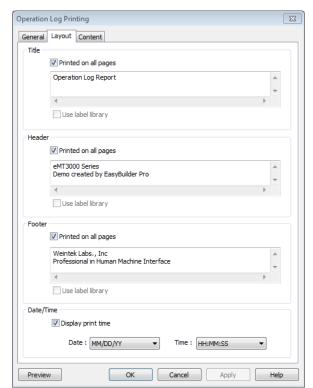


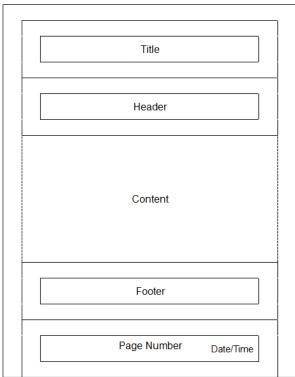


Setting	Description			
Printer	Select the device to save the Operation Log sheet. If a printer is			
	selected, the paper size should be A4. If an external device is			
	selected, the Operation Log sheet is saved as a JPEG file. The			
	system generates a folder named "operationlogsheet", and the files			
	saved in the folder are named "print date_sequence number". For			
	example, the firs	st JPEG file save	ed on 2013/05/08	3 is named
	130508_0000 ar	nd so on.		
Orientation	Sets the layout o	of the Operatio	n Log sheet to be	horizontal or
	vertical.			
Font	Sets the font and	d the font size t	to of the Operation	on Log sheet. The
	following table li	ists the corresp	onding size.	
	Size	Title	Content	
	Large	20 pt.	16 pt.	
	Middle	16 pt.	12 pt.	
	Small	12 pt.	8 pt.	
Range	Sets the range of the Operation Log to be included in the sheet.			
	Date			
	Sets the range by date, counted from the start day through the			
	number of days entered. The maximum available range is 30 days.			
	Record			
	Sets the range by the number of records. The maximum available			
	range is 10000 records.			
Trigger	Sets the register to control Operation Log Printing. When the			
address	register is set ON	N, it starts print	ing. When the pr	rinting is done, the
	register is set OFF automatically.			
Preview	Preview the result before generating the Operation Log sheet.			



Layout Tab



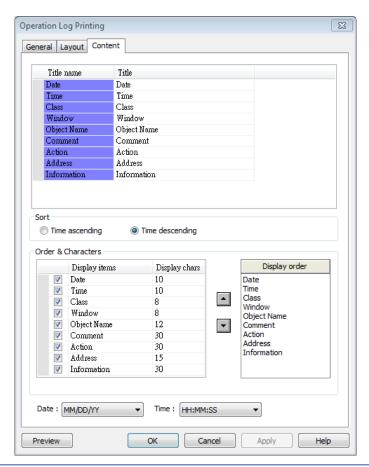


The layout of each part is shown in the above figure.

Setting	Description	
Title	Sets the content of the title. The title is limited to one line.	
	Printed on all pages	
	If selected, the title is shown on each page; otherwise, the title is	
	shown on the first page.	
Header	Sets the content of the header. The header can have 5 lines in	
	maximum.	
	Printed on all pages	
	If selected, the header is shown on each page; otherwise, the	
	header is shown on the first page.	
Footer	Sets the content of the footer. The footer can have 5 lines in	
	maximum.	
	Printed on all pages	
	If selected, the footer is shown on each page; otherwise, the footer	
	is shown on the last page.	
Date/Time	If selected, the date/time the in the sheet is shown on the	
	lower-right corner of each page; otherwise, the date/time is not	
	shown.	
Page number	Shown on each page.	



Content Tab



Setting	Description	
Title	Sets the title displayed.	
Sort	Time ascending	
	The latest record is placed at the bottom.	
	Time descending	
	The latest record is placed at the top.	
Date/Time	Sets the format of date and time displayed.	

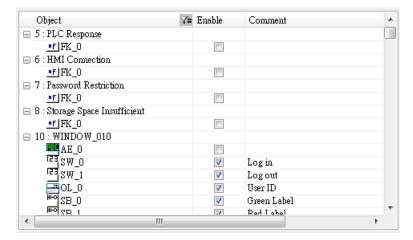
13.35.3.3. Demonstration

Example 1

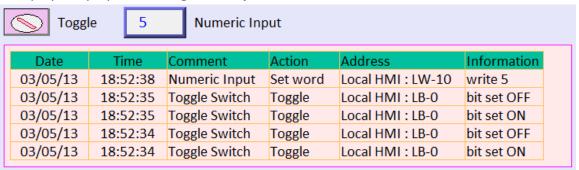
The following demonstration explains how to create an Operation Log project.

- 1. Create a Toggle Switch object and a Numeric object on window number 10.
- Go to Operation Log Settings; enable the Toggle Switch object and Numeric object on window number 10.





- Create an Operation Log View object and finish relevant settings. 3.
- 4. Run off-line simulation; trigger Toggle Switch and Numeric object. Operation Log is displayed by Operation Log View object.



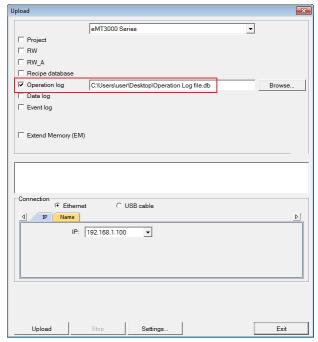


Click the icon to download the demo project. Please confirm your internet connection.

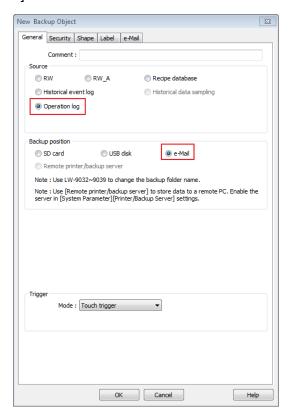
Example 2

Upload Operation Log to PC by using Utility Manager or use Backup object to send the file by email.

- Upload by Utility Manager
- Open Utility Manager, click [Upload]. 1.
- 2. Select [Operation log], enter file name and HMI IP, and then click [Upload].



- Send the sheet by e-mail
- 1. Open [System Parameter Settings] » [e-Mail] tab. Set e-mail server and the address of recipient and sender.
- Create a Backup object, under [Source] select [Operation log], and under [Backup position] select [e-Mail].



For more information about e-Mail settings, see "5 System Parameter Settings".



13.36. Combo Button

13.36.1. Overview

Combo Button can execute multiple commands. The former way was to overlay multiple objects in the same position, and the commands are executed in the order of the layer of the objects. This takes time to test the order when planning the project. Combo Button allows users to easily set multiple commands with one object, and freely adjust the order of executing commands.

The following are the features of Combo Button:

- Executes multiple commands.
- Allows adjusting the order of executing multiple commands.
- Displays the state in Bit or Word Lamp.

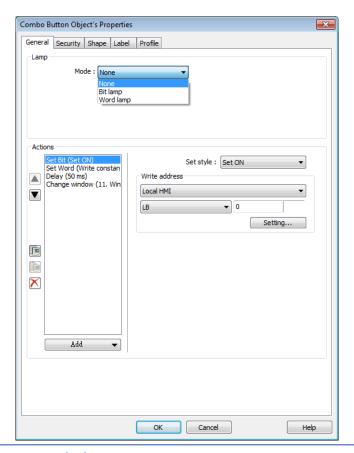
13.36.2. Configuration



Click the Combo Button icon on the toolbar to open a Combo Button object property dialog box. Set up the properties, press OK button, and a new Combo Button object will be created.



General Tab



Setting

Description

Lamp

The mode to display the state of a designated bit or word register.

None: Not using lamps to show states.

Bit Lamp

Displays the state of a designated bit address.

[Invert Signal] Reverses the display of ON / OFF states. For example, if [Invert signal] check box is selected, when the designated bit is OFF, the object displays ON state.

Word Lamp

Displays the state according to the value of a designated word register.

[No. of state]: The number of states used by the object. The state is numbered from 0, so the number of states minus 1 will be the state number. If the value in the word register is \geq [No. of states] defined in Attribute, the highest state will be displayed.

If the number of states is set to 8, the valid states will be 0, 1, 2, ..., 7. In this case if the word value is 8 or higher, the system will display the state 7 shape.



Actions

There are four types of actions: [Delay], [Set Bit], [Set Word], and [Change window]. A combo button can execute up to 20 actions.





Change the order of the actions.





Copy, paste, or delete the selected actions.

Add

Delay

Delays the action for a few seconds. A combo button can set one [Delay] action only.

Set Bit

Sets the designated bit ON or OFF.

Set style	Description		
Set ON	Set ON the designated bit of the device.		
Set OFF	Set OFF the designated bit of the device.		
Toggle	Alternates the bit state each time pressed.		
Momentary	Holds the bit ON only while button is pressed.		

Set Word

Sets the value in the designated register.

Set style	Description
Write	Writes a constant value to the designated
Constant Value	register.
JOG+	Increases value in register by a set amount in
	[Inc. value] each time when the button is
	pressed, to the [Upper limit].
JOG-	Decreases value in register by a set amount in
	[Dec. value] each time when the button is
	pressed, to the [Bottom limit].
Dynamic limits	Sets the Upper / Bottom limit by a designated
IIIIIIUS	register.
	When Dynamic Address is LW-n, where n is an
	arbitrary number, set upper limit when using
	[JOG+], and bottom limit when using [JOG-].

Change Window

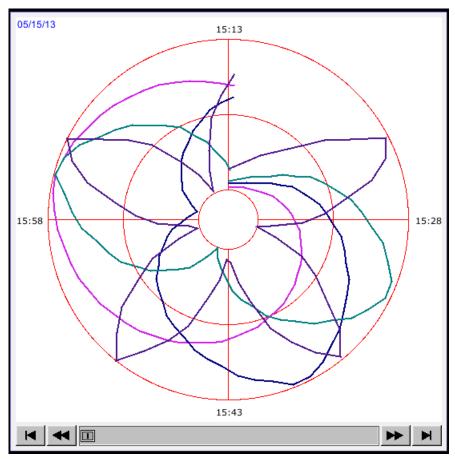
Switch to the designated window. A combo button can only set one [Change Window] action, and this action is always the last one executed.



13.37. Circular Trend Display

13.37.1. Overview

Circular Trend Display object draws the trend curve of Data Sampling in a polar coordinate system, where y-axis represents the radial coordinate and the x-axis represents the angular coordinate. The way to use this object is similar to using Trend Display object.

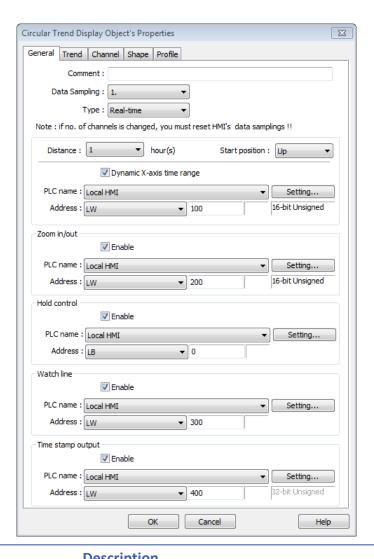


13.37.2. Configureation



Click the Circular Trend Display icon on the toolbar to open the property dialog box. Set up the properties, press OK button, and a new Circular Trend Display object will be created.





Setting	Description	
Data Sampling	Selects the data source for drawing the trend curve.	
Туре	Selects the type of the trend from [Real-time] or [History].	
	Real-time	
	In this mode, it displays a fixed number of sampling data	
	from the moment HMI starts to present. The number of	
	sampling data is determined by the [Max. data records	
	(real-time mode)] setting of Data Sampling object. If the	
	number of sampling data exceeds this number, the earlier	
	data will not be displayed. To display earlier data or the	
	data in other days, please select [History] mode.	
	[Hold control] address can be used to pause refreshing the	
	display. This only stops displaying new data in the Circular	
	Trend Display object, and the data is still being sampled by	



Data Sampling object.

History

In this mode, it displays the sampled data sorted by date. Select the data source from [Data Sampling], and then use [History control] address to view the records of different dates.

Note

If [Show scroll control] check box in Trend Tab is not selected, the earlier data cannot be viewed when exceeding the specified [Distance].

For example: Set [Distance] to 1 (hour.), then sampling data earlier than one hour is not displayed.

Refresh data automatically

If enabled, the window in which the Circular Trend Display object (in history mode) is placed will be refreshed once per second.

- The scroll controls can be used to check the refresh status.
 - If button is displayed, the Circular Trend Display will be automatically refreshed.
 - If **b** button is displayed, the Circular Trend Display will stop being refreshed.
- Scrolling backward and viewing earlier data will disable [Refresh data automatically]. The button displayed is at this moment.
- If [Refresh data automatically] is selected, the display is refreshed when change back to this window, regardless of the use of scroll controls.

Example: If [Refresh data automatically] is selected, scrolling to the earlier display stops auto-refresh. At this moment change to another window and then change back, the Circular Trend Display is still refreshed.

If [Refresh data automatically] is not enabled when building the project, to enable it directly on HMI, simply press . Please note that auto-refresh remains disabled after window change.



Distance	Defines the time length that the circle represents, the unit			
	is hour, the range is 1 to 24 (is hour, the range is 1 to 24 (hours).		
Start position	The position from where to start drawing the trend curve.			
	(Up)	(Right)		
	14:26:46 05/15/13 14:15 15:00 14:30	14:27:06 05/15/13 15:00 14:45		
	(Down)	(Left)		
	14:27:36 05/15/13 14:45 14:30 14:15	14:27:56 05/15/13 14:30 14:45		
Dynamic X-axis	If selected, a word register can be designated to control the			
time range	time length of Circular Trend	d Display. The unit is hour. If no		
	value is entered, the distanc	value is entered, the distance is set to default.		
Zoom in / out	Enlarge or reduce the size of	f the object. The maximum size		
	_	is 10 times larger. If 0 is entered in the designated register, the effect equals entering 1, the object remains the original		
Hold control	When the register is set ON, suspend the update of Circular			
	Trend Display. It does not stop the sampling process of Data Sampling object. This setting is available only in Real-time mode.			
History control	History data is sorted by date. The system uses [History			
	control] to select the history data that are created in			
	different dates and then disp	olays it by Circular Trend		
	Display object.			
	If the value of the designated register in [History control] in the Circular Trend Display object displays the latest			



record. If the value is 1, the second latest record is displayed and so on. This setting is available only in History mode.

If use with Option List object and select data source as [Dates of historical data], the history data will be sorted by date and displayed in Option List object, see "13.29 Option List".

In the following example, when history control address is set to LW-0, and there are 4 sampling data: 20061120.dtl, 20061123.dtl, 0061127.dtl, 20061203.dtl. The corresponding data selected by the value in history control address is as the following list.

Value in LW-0	The sampling data displayed
0	20061203.dtl
1	20061127.dtl
2	20061123.dtl
3	20061120.dtl

Watch line

Displays a watch line when user touches the Circular Trend Display object, and the sampling data at the position of the watch line is output to the designated register. To display sampling data with multiple channels, the system consecutively writes the data of each channel to the designated word register and the following registers. If the data format of each channel is different, the channels are sorted by the data format of its corresponding register. In the following example, when watch address is set to LW-0, and there are 4 sampling data, the format of each data is: 16-bit Unsigned, 32-bit Unsigned, 32bit Signed, and 16-bit Signed. The corresponding watch address is as the following list.

Channel	Data Format	Data Length	Watch Address
0	16-bit Unsigned	1 Word	LW-0
1	32-bit Unsigned	2 Words	LW-1
2	32-bit Signed	2 Words	LW-3
3	16-bit Signed	1 Word	LW-5

Time stamp output

If selected, the system will start counting time from the first data sampled, and output the elapsed time counted of



the latest data sampled to the register designated in [Time stamp output + 2]. When pressing a point on the trend curve, the relative time of the nearest data sample is then output to [Time stamp output address].

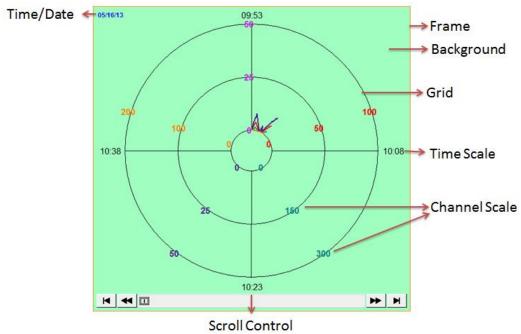
Note

The format of the register designated in [Time stamp output] and [Time stamp output + 2] must be 32-bit. [Time stamp output + 2] is only available for Real-time mode while [Time stamp output] is available for Real time mode and History mode.

Trend Tab



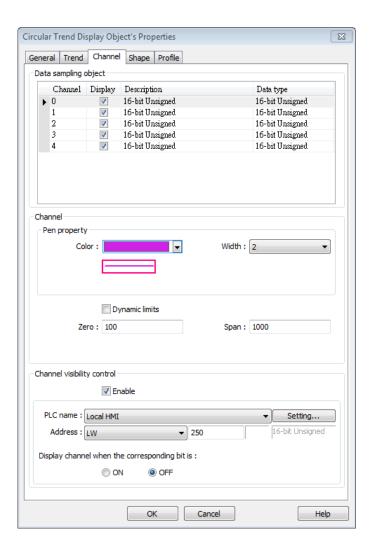




	Sci on Control
Setting	Description
Profile	Frame
	Sets the color of the frame of the object.
	Background
	Sets the color of the background of the object.
	Show scroll controls
	The scroll controls are displayed for scrolling to view
	the sampling data of other time range. The
	minimum scrolling unit is determined by the setting
	of [Distance] in General tab. If [Show scroll controls]
	check box is not selected, the earlier data cannot be
	viewed when exceeding the specified [Distance].
	For example: Set [Distance] to 1 (hour.), then
	sampling data earlier than one hour is not displayed.
Grid	Sets the number and the color of the dividing lines.
	Y-axis
	Sets the number of divisions on Y axis.
	Font size
	Sets the size of the font which labels the time scale
	or channel scale.
	Time scale
	If enabled, displays the time scale. When the time
	length is longer than 1 hour, the scale division is 1
	hour. When the time length is set to 1 hour, the scale
Grid	Sets the number and the color of the dividing lines. Y-axis Sets the number of divisions on Y axis. Font size Sets the size of the font which labels the time scale or channel scale. Time scale If enabled, displays the time scale. When the time length is longer than 1 hour, the scale division is 1

	division is 15 minutes.
	Channel scale
	If enabled, displays the channel scale. The color of
	the font which labels the channel scale corresponds
	to the setting of the trend curve of each channel.
Time / Date	Time
	Sets the display format of time.
	Date
	Sets the display format of date.

Channel Tab



Setting	Description
Channel	Sets the style and the color of the trend curve, and
	the upper and lower limit of data that can be drawn
	on the trend curve. Up to 8 channels are supported
	simultaneously.



Not selecting [Dynamic limits]

The upper and lower limits of the data are set by constants.

Selecting [Dynamic limits]

The upper and lower limits are set by the designated register. When the address is LW-n, the corresponding addresses are as the following list.

Data format	16-bit	32-bit
Lower limit	LW-n	LW-n
Upper limit	LW-n+1	LW-n+2

Channel Visibility Control

If [Enable] is selected, the bits of the designated word register will be used to show/hide each channel. First bit (Bit-0) controls the first channel; second bit (Bit-1) controls the second channel, and so on.

Display channel when the corresponding bit is:

If [ON] is selected, when the corresponding bit is OFF, the channel is hidden. If [OFF] is selected, when the corresponding bit is ON, the channel is hidden. In the following example, the control address of channel visibility is set to LW-0 and each channel shows when the corresponding bit is OFF. If there are 5 channels, the visibility of the channels is as the following list.

Channel	Control address	Bit state	Display
0	LW_bit-000	OFF	YES
1	LW_bit-001	ON	NO
2	LW_bit-002	ON	NO
3	LW_bit-003	OFF	YES
4	LW_bit-004	OFF	YES



13.38. Picture View

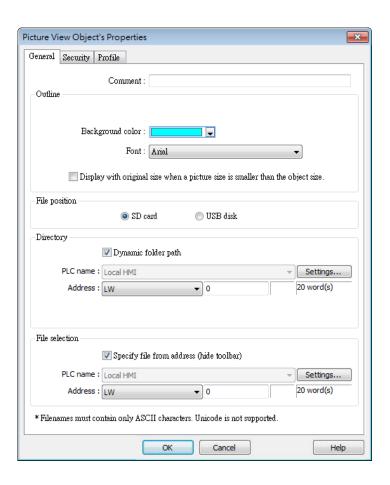
13.38.1. Overview

Picture View object plays slideshow of picture files saved in an external device such as a USB drive or SD card.

13.38.2. Configuration



Click the Picture View icon on the toolbar to open the property dialog box. Set up the properties, press OK button, and a new Picture View object will be created.





Setting	Description
Outline	Sets the toolbar position, background color, and text font
	of the Picture View object.
	Hide delete button
	If selected, the delete button will not be displayed on the
	Picture View object toolbar. The delete button is used to
	delete the picture currently viewed.
	Display with original size when a picture size is smaller
	than the object size.
	If selected, when the size of the picture is smaller than the
	Picture View object, this setting helps to prevent distortion
	caused by enlarging the picture.
File position	Select the file source of the picture files from [SD card] or
	[USB disk].
Directory	The directory where the picture files are saved.
	Dynamic folder path
	Designate folder path by a local address.
File selection	Specify file from address (hide toolbar)
	If enabled, the displayed picture is designated by a file
	name in a local address, and the toolbar will be hidden.



Objects

- The file name must be all in ASCII characters, and the Unicode characters are not supported.
- The supported picture formats are: .jpg, .bmp, .gif, .png.



13.39. File Browser

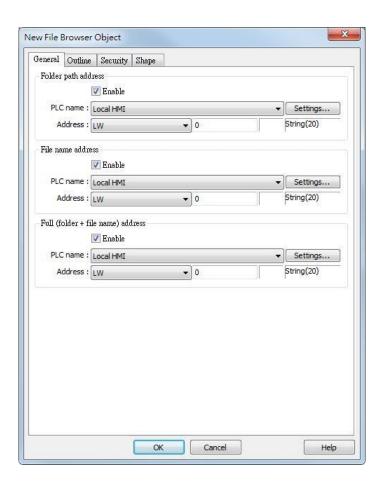
13.39.1. Overview

File Browser object can display files and folders saved in the SD card or USB disk. Apart from browsing for the files in the external devices, the name of the file and the file path selected in File Browser object can be written to the designated address.

13.39.2. Configuration



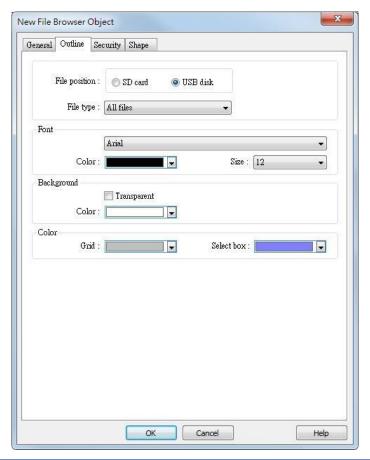
Click the File Browser icon on the toolbar, or select Tools » File Browser to open a File Brower object property dialog box and set up the properties.





Setting	Description
Folder path address	Current directory.
File name address	The file name of the currently selected file.
Full (folder + file	The full directory and file name of the currently
name) address	selected file.

Outline Tab



Setting	Description	
Folder position	Select the position of the file from SD card or USB	
	disk.	
File type	Select all files or only CSV file to be displayed.	
Font / Background / Color	Set the attributes and font of the object.	



■ The file name and the directory of the selected file will be written to the designated address, but changing the contents of the designated address will not change the selected file in the File Browser.



The system will read the folder path address and file name address when the HMI is restarted or when an external device is inserted to the unit. If valid data is can be read from the designated address, the system will then automatically navigate to the appropriate directory and highlight the file according to the data read. If [Folder path address] is not enabled, the data at Full (folder + file name) address will be read.



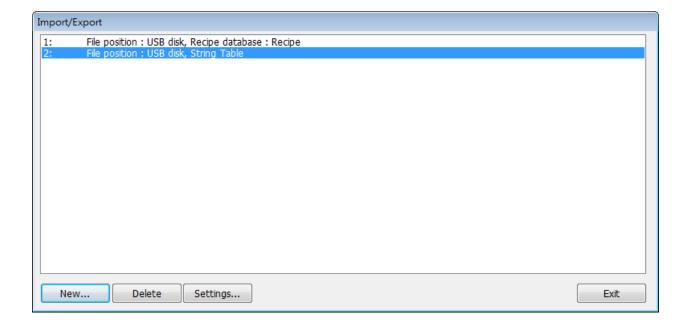
13.40. Import/Export

13.40.1. Overview

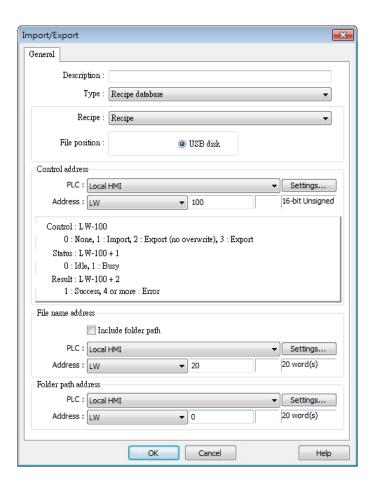
With Import/Export object, Recipe Database or String Table can be imported or exported.

13.40.2. Configuration

Click the Import/Export icon on the toolbar to open the Import/Export Object management dialog box. To add an Import/Export object, click [New], set up the properties, press OK button and a new Import/Export object will be created.







Setting	Description
Туре	Select the file source from Recipe Database or
	String Table.
File position	Select the external device from SD card or USB disk
	for import/export.
Recipe	Select the recipe. This option is hidden when select
	String Table.
Control address	Designate the control address used for performing
	import/export, or displaying the result.
	Control: Control Address
	0: None
	1: Import
	2: Export (no overwrite)
	3: Export
	Status: Control Address+1
	0: Idle



	1: Busy
	Result: Control Address +2
	1: Success
	4: The file already exists, no overwriting.
	Other: Error
File name address	The name of the imported/exported file. If [Include
	folder path] is selected, the full directory and file
	name will be included at this address.
Folder path address	The directory of the imported/exported file.

Example 1

The following is an example on recipe export/import settings.

Field	Setting
File position	USB disk
Recipe	Recipe_A (or other recipe)
Control address	LW-100
File name address	LW-200
Folder path address	LW-250

- 1. Create two ASCII Input objects. Set address to LW-200 and LW-250 respectively.
- 2. Enter the file name in LW-200: 2015_recipe.csv
- 3. Enter the folder path in LW-250: Setting
- 4. Use a Set Word object to write value 3 to LW-100. Then, Recipe_A will be exported to the USB disk, in the "Setting/2015_recipe.csv" file.



■ When performing "Export (no overwrite)" command, if the target file already exists, the export operation will be canceled, and the result value will be set to "4".

The following lists the result values and the information.

Result (HEX)	Information
0x1	Success
0x4	File already existed and will not overwrite
0x100	Data contains non-numeric data
0x101	Path contains invalid string ""
0x102	Communication error while updating Recipe DB
0x103	Error while reading Recipe DB information from



	project file		
0x200	General exception		
0x201	General status error		
0x202	Import to unknown database type		
0x203	Error while validating Recipe DB table definition		
0x204	Error while validating Recipe DB table data		
0x205	Error while writing Recipe DB table definition		
0x206	Error while writing Recipe DB table data		
0x300	File error: Unknown error		
0x301	File error: Empty file name		
0x302	File error: Insufficient file storage or no external		
	devices		
0x303	File error: Invalid file name (directory or special		
	files)		
0x304	File error: Unable to remove file		
0x305	File error: Open file stream error		
0x306	File error: Unhandled BOM		
0x307	File error: Error while parsing CSV file (incorrect		
	formats)		
0x400	Database general exception		
0x401	Database error: Unable to open table		
0x402	Database error: Unable to get rows		
0x403	Number of columns in CSV file and in Recipe DB do		
	not match		



13.41. Pie Chart

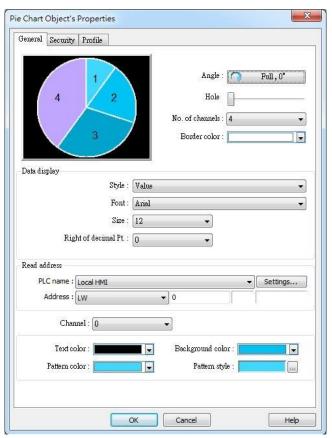
13.41.1. Overview

The Pie Chart object draws a pie chart that is divided into slices to illustrate numerical proportion, according to the value of the designated read address.

13.41.2. Configuration



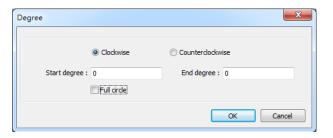
Click the Pie Chart icon on the toolbar to open the property dialog box. Set up the properties, press OK button, and a new Pie Chart object will be created.



Setting	Description
Angle	Set the [Start degree] of the chart. Choose the Chart
	to be [Clockwise] or [Counter clockwise].
	If [Full circle] isn't selected, then [End degree] must

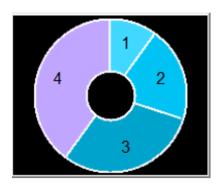


be set.



Hole

Set the size of the hollow circle in the center of Pie Chart.



No. of channels	Set the number of channels to be displayed in the			
	chart. The range is from 2 to 16.			
Border color	Set the color of the border.			
Data display	The [Style] can be set as [None], [Value] and			
	[Percentage]. The [Font] and [Size] are for the text			
	on the chart. For Value Style, the [Right of decimal			
	Pt.] can set the value on the chart to be displayed			
	with the decimal point. The [Right of decimal Pt.]			
	option is only available for [Value] style.			
Read Address	The address is for channel 1. The following			
	consecutive addresses are for the rest of the			
	channels. For example, if the Read Address is LW-0,			
	then the Read Address for channel 2 is LW-1;			
	channel 3 is LW-2and so on.			
Channel	Set the [Text color], [Background color], [Pattern			
	color], and [Pattern style] of the selected channel.			
	The [Background color] is for the [Pattern style] that			
	has background. If the [Pattern style] doesn't have a			
	background, then the [Background color] doesn't			
	need to be set.			



13.42. QR Code

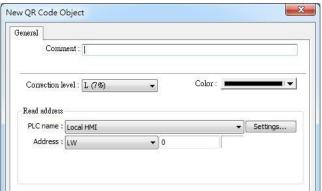
13.42.1. Overview

The QR Code object transfers the information from the read address into QR code.

13.42.2. Configuration



Click the QR Code icon on the toolbar to open the property dialog box. Set up the properties, press OK button, and a new QR Code object will be created.



t				
Setting	Description			
Correction level	QR code has error correction capability to restore			
	data if the code is dirty or damaged.			
	Four correction levels are available: L, M, Q, and H.			
	The data restoration rate is listed below. (The data			
	restoration rate for total codewords. Codeword is a			
	unit that constructs the data area.)			
	Correction	ո Level		
	L	7%		
	M	15%		
	Q	25%		
	Н	30%		
Color	Set the QR code color.			
Read address	The QR Code object will display the QR code			
	generated from the information entered by the read			
	address. The word length limit: 1 $^{\sim}$ 1024.			



13.43. String Table

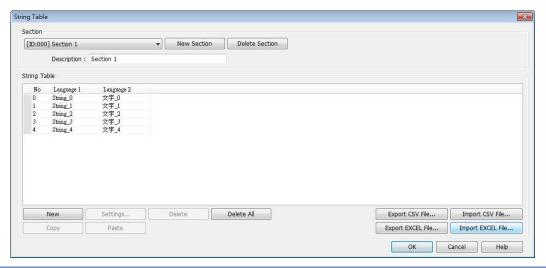
13.43.1. Overview

By pre-configuring the texts and their corresponding numbers in the String Table, the text can be changed dynamically on HMI. String Table can also be used in a multi-language environment.

13.43.2. Configuration



Click the String Table icon on the toolbar to open the property dialog box. Set up the properties, press OK button, and a new String Table object will be created.



Setting	Description		
Section	A list of all the existing String Tables.		
	[New Section] Add a new String Table.		
	[Delete Section] Delete the selected String Table.		
New	Add a new string in the table.		
Settings	Set the content of the selected string.		
Export CSV File	Export all the existing String Tables as a *.csv file.		
Import CSV File	ile Import *.csv file into the String Table.		
Export EXCEL File	Export all the existing String Tables as a *.xls file.		
Import EXCEL File Import *.xls file into the String Table.			



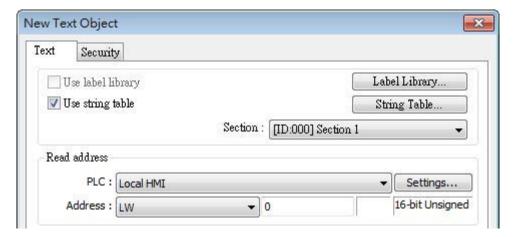
■ The font of multiple languages in the String Table must be specified in Label Text Library.



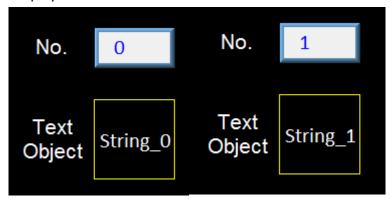
Example 1

1. Create a String Table using the same settings as the preceding figure.

2. Create a Text object, select [Use string table] check box, and set read address to LW-0.



- 3. Create a Numeric object, set address to LW-0.
- 4. When the value in LW-0 is 0, the No. 0 string is displayed; when the value in LW-0 is 1, the No. 1 string is displayed.





13.44. Database Server

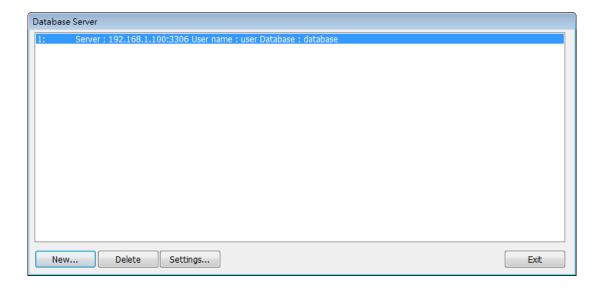
13.44.1. Overview

Database Server object enables HMI to connect the MySQL database server in PC, allowing the user to send sampled data or event log to the MySQL database server in PC.

13.44.2. Configuration



Click the Database Server icon on the toolbar to create a Database Server object. Or, click [Object] » [Database Server] in the menu.





General Tab

Setting	Description	
IP	Enter the IP address of the database.	
Port	Enter the port number of the database.	
Username	Enter the username for connecting the database.	
	The maximum is 32 words.	
Password	Enter the password for connecting the database.	
	The maximum is 32 words.	
Database name	Enter the name of the database for collecting	
	historical data.	

Address Tab

Setting	Description		
Status address	LW-n: Displays the connection status of Database		
	Server.		
	Value	Description	
	0	Not attempting to connect to database.	
	1	Failed to connect to database.	
	2	Connection succeeded.	
	LW-n+1:	: Error indicator.	
	Value	Description	
	0	No error	
	1 or more	re An error occurred	
Control address	LW-n: Controls the operation of Database Server.		
	Value Description		
	0	Ready	
	1	1 Start	
	2	Stop	
	3	Update	
	LW-n+1: Sets the IP address of the database.		
	LW-n+5: Sets the port number of the database.		
	LW-n+6: Sets the username for connecting database.		
	LW-n+22: Sets the password for connecting		
	database.		
	LW-n+38: Sets the name of the database for		
	collecting	ng historical data.	

• If sampled data is successfully synchronized to the SQL database, three tables will be generated in the database, and the sampled data is saved in *_data table.

Table	Description
<hami name="">_<datalog name="">_data</datalog></hami>	Saves data sampling
<pre><hmi name="">_<datalog name="">_data_format</datalog></hmi></pre>	System folder
<pre><hmi name="">_<datalog name="">_data_section</datalog></hmi></pre>	System folder



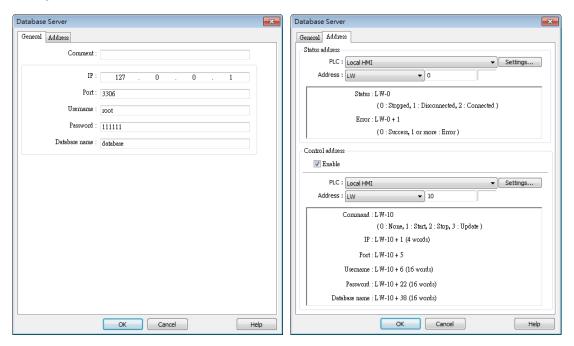
 When synchronizing event log, the three tables generated in the database are listed as the following table, and the event log is saved in *_event table.

Table	Description
<hmi name="">_event</hmi>	Saves event log
<pre><hmi name="">_event_log</hmi></pre>	System folder
<pre><hmi name="">_event_update_time</hmi></pre>	System folder

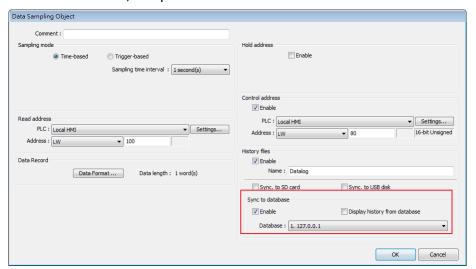
• If the content of data sampling / event log, such as data format or event message, is changed and downloaded to HMI, please delete the tables listed above first, and then the new content will thus be effective.

Example 1

 Create a Database Server object, set Status Address to LW-0, and Control Address to LW-10.



2. Create a Data Sampling object, in [Sync. to database] group box select [Enable], and set Control Address to LW-80, to update or clear HMI historical data.





3. If the database is successfully connected, the status indicator LW-0 displays 2 (connection succeeded), and the error indicator LW-10 displays 0 (no error).

Write 2 in LW-80 (sync. data). Open SQL database, the data can be found in table <HMI NAME>_<DATALOG NAME>_data.





13.45. MQTT

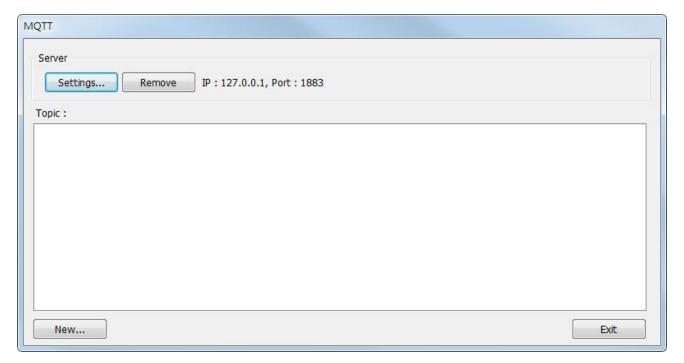
13.45.1. Overview

MQTT object can send message to a remote server. HMI can serve as a local server. When HMI serves as a local server, the HMI will not send message to the remote server. This feature supports MQTT ver. 3.1.

13.45.2. Configuration

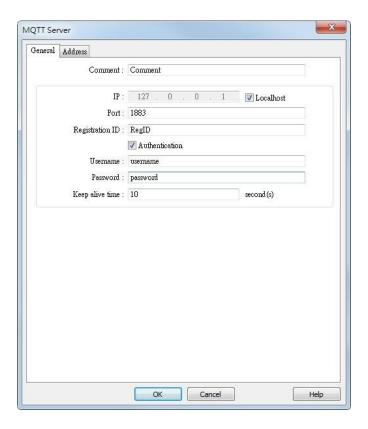


Click the MQTT icon on the toolbar to create a MQTT object. Or, click [Object] » [MQTT] in the menu. Please note that the Server setting cannot be removed if the MQTT Topic is already specified.





13.45.2.1. Server Settings



General Tab

Setting	Description	
IP	Enter the MQTT Server IP address for receiving the	
	message.	
Port	Enter the MQTT Server port number for receiving	
	the message.	
Registration ID	Enter the registration ID.	
Authentication	If selected, connecting MQTT Server will require	
	[Username] and [Password].	
Username	Enter the username for connecting MQTT Server.	
Password	Enter the password for connecting MQTT Server.	
Keep alive time	When MQTT Server does not receive the message	
	from HMI passing the specified time, the HMI will be	
	identified as disconnected.	
	Note: When running simulation, the message may	
	be delayed, but the delay will not exceed the [Keep	
	alive time]. The message from the HMI will be sent	
	immediately.	



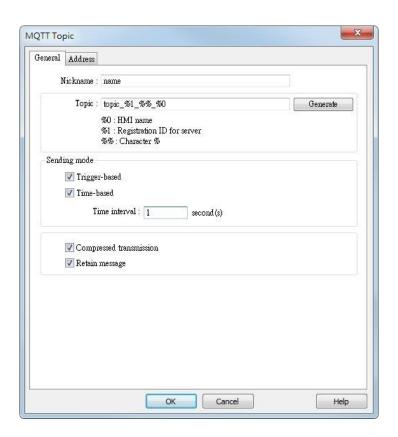
Address Tab

Setting	Descripti	on		
Status address	LW-n: Displays the connection status to MQTT			
	Server.			
	Value	Description		
	0	Not attempting to connect to MQTT		
		Server.		
	1	1 Disconnected and can't connect		
		М	QTT Server.	
	2	Connection succeeded.		
	LW-n+1:	Erro	r indicator.	
	Value		Description	
	0		No error	
	1 or more		An error occurred	
Control address	LW-n: Controls the operation of MQTT Server.			
	Value	De	escription	
	0	Re	eady	
	1	Start		
	2	Stop		
	3	Update		
	LW-n+1: Sets the IP address of MQTT Server.			
	LW-n+5: Sets the port number of MQTT Server.			
	LW-n+6: Sets the Registration ID for connecting			
	MQTT Server.			
	LW-n+26: Enables / Disables authentication. Value Description			
	0	Disable		
		Enable		
	LW-n+27: Sets the username for connecting MQTT Server.			
	LW-n+43: Sets the password for connecting MQTT			
	Server.			



13.45.2.2. Topic Settings

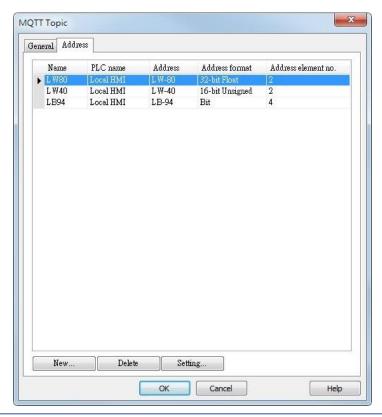
General Tab



Setting	Description	
Nickname	Enter the nickname of the MQTT Topic for easier	
	reference.	
Topic	Specify the format of the message topic sent to	
	MQTT Server.	
Sending mode	Select the sending mode from Trigger-based or	
	Time-based, or both.	
Compressed	The message will be compressed before being sent,	
transmission	and decompression is needed before reading the	
	message.	
Retain message	If selected, the MQTT server will save the latest	
	message.	



Address Tab



Setting	Description	
New	Add the source of the topic. The length of each	
	address can be specified respectively.	
Delete	Delete the address.	
Setting	Change the name and address.	



13.46. Dynamic Scale

13.46.1. Overview

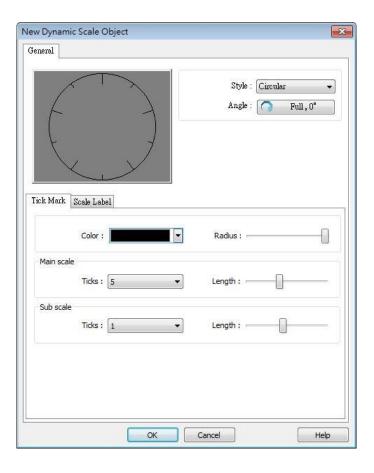
Dynamic Scale offers customizable tick marks and scale labels and can be used together with objects such as Trend Display, Bar Graph..., etc.

13.46.2. Configuration



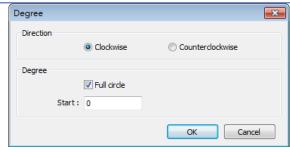
Click the Dynamic Scale icon on the toolbar to open a Dynamic Scale object property dialog box. Set up the properties, press OK button, and a new Dynamic Scale object will be created.

General Tab



Setting	Description
Style	Select the style from [Circular], [Horizontal], or [Vertical]. If select
	[Circular], set the [Direction] and [Degree].





Direction

Select from [Clockwise] or [Counterclockwise].

Degree

If [Full circle] is selected, set the start degree.

If [Full circle] is not selected, set the start and end degree.



Tick Mark

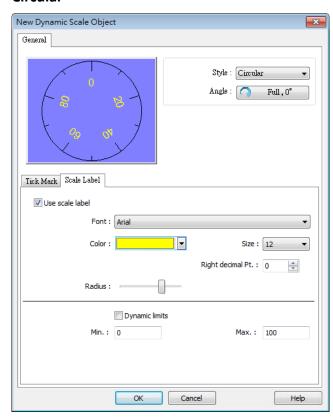
Select the color of the tick mark, and set the number of ticks for the main and sub scale (major and minor tick mark).

For [Circular] style, the length of the major and minor tick mark, and the radius of the circular tick mark can be set.

Scale Label

Displays major tick labels.

Circular



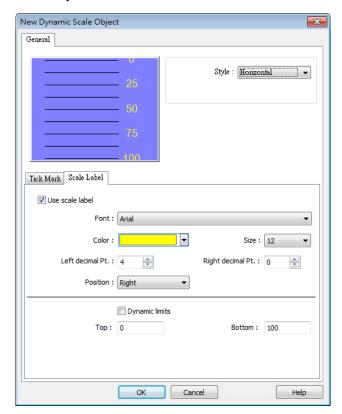
Set the font, font color, font size, and decimal point of the scale



label.

Set the radius start from the center of the object to the position to place the scale label.

Virtical / Horizontal



Set the font, font color, font size, and decimal point of the scale label.

Set the position to display the scale label.

The Max. and Min. limits of the scale label can be specified. If [Dynamic limits] is selected, the Max. and Min. limits can be set by the designated word addresses.

